Site Management Plan

500 South Union Street Site Spencerport, New York BCP Site No. C828153

December 2014

0188-013-001

Prepared For:

Eyezon Associates, Inc.







2558 Hamburg Turnpike, Suite 300, Buffalo, New York | phone: (716) 856-0599 | fax: (716) 856-0583

BROWNFIELD CLEANUP PROGRAM

SITE MANAGEMENT PLAN

500 SOUTH UNION STREET SITE NYSDEC SITE NUMBER: C828153 SPENCERPORT, NEW YORK

December 2014

0188-013-001

Prepared for:

Eyezon Associates, Inc.



TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

Table of Contents

1.0	INT	RODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM	1
	1.1	Introduction	1
		1.1.1 General	1
		1.1.2 Purpose	2
		1.1.3 Revisions	3
	1.2	Site Background	3
		1.2.1 Site Location and Description	3
		1.2.2 Site Environmental History	3
		1.2.3 Geologic Conditions	5
		1.2.3.1 Overburden	5
		1.2.3.2 Bedrock	6
		1.2.3.3 Hydrogeology	6
	1.3	Summary of Remedial Investigation Findings	7
		1.3.1 Soil/Fill	7
		1.3.2 Groundwater	8
		1.3.3 Soil Vapor	8
	1.4	Summary of Remedial Actions	9
		1.4.1 Removal of Contaminated Materials from the Site	10
		1.4.2 Drum removal	10
		1.4.3 Remedial Soil/Fill Excavation	10
		1.4.4 Site-Related Treatment Systems	11
		1.4.4.1 Active Subslab Depressurization System	11
		1.4.4.2 In-Situ Groundwater Treatment Injection	11
		1.4.5 Remaining Contamination	12
		1.4.5.1 Soil/Fill	12
		1.4.5.2 Groundwater	12
		1.4.5.3 Soil V apor	13
•	-		
2.0	ENC	GINEERING & INSTITUTIONAL CONTROL PLAN	14
	2.1	Introduction	14
		2.1.1 General	14
		2.1.2 Purpose	14
	2.2	Engineering Controls	15
		2.2.1 Cover System	15
		2.2.2 Active Subslab Depressurization (ASD) System	15
	2.3	Criteria for Completion of Remediation/Termination of Remedial Systems	17
		2.3.1 Composite Cover System	17
		2.3.2 Active Sub-slab Depressurization (ASD) System	17
		2.3.3 Groundwater Monitoring	17
	2.4	Institutional Controls	17
		2.4.1 Excavation Work Plan	19
		2.4.2 Soil Vapor Intrusion Evaluation	20
	2.5	Inspections and Notifications	21



Table of Contents

		2.5.1 Inspections	
		2.5.2 Notifications	
	2.6	Contingency Plan	22
		2.6.1 Emergency Telephone Numbers	
		2.6.2 Map and Directions to Nearest Health Facility	
		2.6.3 Response Procedures	
3.0	Siti	E MONITORING PLAN	25
	3.1	Introduction	25
		3.1.1 General	
		3.1.2 Purpose and Schedule	
	3.2	Cover System Monitoring	26
	3.3	Media Monitoring Program	27
		3.3.1 Groundwater Monitoring	
		3.3.1.1 Sampling Protocol	
		3.3.1.2 Monitoring Well Repairs, Replacement & Decommissioning	
		3.3.2 ASD System Monitoring	
	3.4	Site-Wide Inspection	
	3.5	Monitoring Quality Assurance/Quality Control	
	3.6	Monitoring Reporting Requirements	32
4.0	0.57		24
4.0	Ope	ERATION & MAINTENANCE PLAN	
4.0	Оре 4.1	ERATION & MAINTENANCE PLAN Introduction	34 34
4.0	Оре 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance	34
4.0	Оре 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System	
4.0	Оре 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing	
4.0	OPE 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.2.1 ASD System Restart Procedure and Testing	
4.0	OPE 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.3 ASD System Restart Procedure and Testing 4.2.3 ASD System Operation	
4.0	OPE 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction. Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System. 4.2.2 Initial ASD System Start-Up and Testing. 4.2.3 ASD System Restart Procedure and Testing. 4.2.3 ASD System Operation. 4.2.4 Non-Routine Equipment Maintenance.	
4.0	OPE 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.2.1 ASD System Restart Procedure and Testing 4.2.3 ASD System Operation 4.2.4 Non-Routine Equipment Maintenance 4.2.5 Monthly Performance Monitoring	
4.0	OPE 4.1 4.2	ERATION & MAINTENANCE PLAN Introduction. Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System. 4.2.2 Initial ASD System Start-Up and Testing. 4.2.2.1 ASD System Restart Procedure and Testing. 4.2.3 ASD System Operation. 4.2.4 Non-Routine Equipment Maintenance. 4.2.5 Monthly Performance Monitoring. 4.2.6 Annual ASD System Certification/Inspection.	
4.0 5.0	OPE 4.1 4.2 INSI	ERATION & MAINTENANCE PLAN Introduction. Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System. 4.2.2 Initial ASD System Start-Up and Testing. 4.2.3 ASD System Restart Procedure and Testing. 4.2.4 Non-Routine Equipment Maintenance. 4.2.5 Monthly Performance Monitoring. 4.2.6 Annual ASD System Certification/Inspection.	
4.0 5.0	OPE 4.1 4.2 INSI 5.1	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.2.1 ASD System Restart Procedure and Testing 4.2.3 ASD System Operation 4.2.4 Non-Routine Equipment Maintenance 4.2.5 Monthly Performance Monitoring 4.2.6 Annual ASD System Certification/Inspection PECTIONS, REPORTING & CERTIFICATIONS Site Inspections	
4.0	OPE 4.1 4.2 INSI 5.1	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.2 Initial ASD System Start-Up and Testing 4.2.3 ASD System Operation 4.2.4 Non-Routine Equipment Maintenance 4.2.5 Monthly Performance Monitoring 4.2.6 Annual ASD System Certification/Inspection Site Inspections 5.1.1 Inspection Frequency	
4.0	OPE 4.1 4.2 INSI 5.1	 ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance	
4.0	OPE 4.1 4.2 INSI 5.1	 ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance	
4.0	OPE 4.1 4.2 INSI 5.1	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.2 Initial ASD System Restart Procedure and Testing 4.2.1 ASD System Restart Procedure and Testing 4.2.3 ASD System Operation 4.2.4 Non-Routine Equipment Maintenance 4.2.5 Monthly Performance Monitoring 4.2.6 Annual ASD System Certification/Inspection Site Inspections 5.1.1 Inspection Frequency 5.1.2 Inspection Forms, Sampling Data, & Maintenance Reports. 5.1.3 Evaluation of Records & Reporting Certification of Engineering and Institutional Controls	
4.0	OPE 4.1 4.2 INSI 5.1 5.2 5.3	ERATION & MAINTENANCE PLAN Introduction Engineering Control System Operation & Maintenance 4.2.1 Active Subslab Depressurization System 4.2.2 Initial ASD System Start-Up and Testing 4.2.2 Initial ASD System Restart Procedure and Testing 4.2.3 ASD System Operation 4.2.4 Non-Routine Equipment Maintenance 4.2.5 Monthly Performance Monitoring 4.2.6 Annual ASD System Certification/Inspection Site Inspections 5.1.1 Inspections 5.1.2 Inspection Frequency 5.1.3 Evaluation of Records & Reporting Certification of Engineering and Institutional Controls Periodic Review Report	



LIST OF TABLES

Table 1	Remaining Soil/Fill above Unrestricted SCOs
Table 2	Summary of Groundwater Analytical Results
Table 3	Summary of Soil Vapor Analytical Results
Table 4	Summary of Soil Cleanup Objectives
Table 5	Summary of Materials Removed from the site
Table 6	Emergency Contact List (in text)
Table 7	Site Contact List (in text)
Table 8	Monitoring/Inspection Schedule (in text)
Table 9	Schedule of Monitoring/Inspection Reports (in text)
Table 10	Criteria for Imported Soils

LIST OF FIGURES

Figure 1	Site Location and Vicinity Map
Figure 2	Site Plan (Aerial)
Figure 3	Groundwater Monitoring Well Locations and Isopotential Map (August 2014)
Figure 4	Active Subslab Depressurization System Layout
Figure 5	In-Situ Groundwater Treatment Injection Locations
Figure 6	Remedial Excavation
Figure 7	Cover System Layout and Detail
Figure 8	Remaining Soil/Fill Above Unrestricted SCOs

HASP	Hospital Pouto Map
Figure A1	Hospital Route Map



APPENDICES

Appendix A	Excavation Work Plan (EWP)
Appendix B	Environmental Easement
Appendix C	Health and Safety Plan, including Community Air Monitoring Plan
Appendix D	Well Construction Logs
Appendix E	Site Inspection and Field Forms
Appendix F	Groundwater Sampler Product Information
Appendix G	Quality Assurance Project Plan
Appendix H	Active Subslab Depressurization System Documents
Appendix I	Electronic Copy



1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 Introduction

This document is required as an element of the remedial program at the 500 South Union Street Site (hereinafter referred to as the "Site") under the New York State (NYS) Brownfield Cleanup Program (BCP) administered by New York State Department of Environmental Conservation (NYSDEC). The site was remediated in accordance with Brownfield Cleanup Agreement (BCA) Index #B8-0790-08-09, which was executed on August 27, 2009.

1.1.1 General

Eyezon Associates, Inc., entered into a BCA with the NYSDEC to remediate an approximate 1.2 acre property located at 500 South Union Street, Village of Spencerport, Monroe County, New York. This BCA required the Remedial Party, Eyezon Associates, Inc., to investigate and remediate contaminated media at the site. A figure showing the site location and boundaries of this approximate 1.2-acre site is provided in Figures 1 and 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement.

After completion of the remedial work described in the Remedial Action Work Plan (April 2014), some residual soil/fill, soil vapor and groundwater contamination remains on-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 extinguished in accordance with 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 New York State.

This SMP was prepared by TurnKey Environmental Restoration, LLC (TurnKey) in association with Benchmark Environmental Engineering and Science, PLLC (Benchmark), on behalf of Eyezon Associates, Inc., 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

The site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Monroe 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 all ECs and ICs. This SMP specifies the methods necessary ensure compliance with all ECs and ICs required by the Environmental Easement for 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 Engineering and Institutional Controls; (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 (PRRs); and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; including, where applicable, an Operation and Maintenance (O&M) plan for the related treatment systems; (2) an Excavation Plan; and, (3) a Monitoring Plan.

This plan also includes a description of PRRs 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, which is grounds for revocation of the Certificate of Completion (COC);



• Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the BCA (Index # B8-0790-08-09; Site C828153) for the site, and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan will 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 500 South Union Street Site is located in the Village of Spencerport, Monroe County, New York and is identified as Tax ID No. 087.17-1-61, as indicated by the Village of Spencerport tax map. The site is an approximate 1.2-acre area bounded by South Union Street to the west, Nichols Street to the south, residential condominiums/apartments to the north, and a residential/commercial apartment building to the east (see Figures 1 and 2). The boundaries of the BCP Site are more fully described in the- Environmental Easement (see Appendix B).

1.2.2 Site Environmental History

The Site was historically used for agricultural purposes through the 1930s. In subsequent decades, a portion of the existing structure was constructed (1940s) and used as a button factory. In the early 1970s, the Site was used commercially as a dry cleaning facility as well as a hair salon and restaurant. During that time, the first addition to the building was completed. In 1989, a second addition was added to the building completing the present day structure.

The dry cleaner ceased using tetrachloroethene in their dry cleaning process in 2000. Prior housekeeping practices at the site by the dry cleaner operators/owners are suspected to have led to the site contamination.



A Phase I and II Environmental Site Assessment (ESA) was conducted in 1998 as part of a real estate transaction. A second Phase I and II ESA was conducted in April 2008 as part of another real estate transaction. In July 2008, additional subsurface investigation activities were completed to further assess the up and down gradient groundwater quality at the site. The studies indicated that the soil and groundwater at the site were impacted with tetrachloroethene, trichloroethene, and the associated breakdown products above the State's standards and guidance values. Additional information relative to previous studies completed in connection with the site is provided below.

A Focused Phase I/II Environmental Site Assessment (ESA) Report was completed by Haley & Aldrich of New York (H&A) in November 1998. The Phase I ESA findings identified historic use of the Site as a dry-cleaner since the 1970s and evidence of historic exterior disposal/storage of dry-cleaning machine filters in dumpsters sited east of the building. The Phase II study identified elevated concentrations of chlorinated volatile organic compounds (cVOCs), specifically tetrachloroethene (PCE) and trichloroethene (TCE), which are typically associated with dry cleaning operations within groundwater at each of the monitoring well locations. Soil samples exhibited elevated concentrations of cVOCs and were also slightly impacted by petroleum VOCs (pVOCs) at lower concentrations.

In March 2008, TurnKey performed a Phase I ESA and a Phase II Site Investigation at the Site. The Phase I ESA conclusions were generally consistent with the November 1998 H&A ESA. The Phase II investigation results indicated the presence cVOC analytes attributable to past dry-cleaning operations (i.e., PCE and its chemical breakdown products) in on-site soil and groundwater concentrations that exceeded the Unrestricted Use and Groundwater Protection SCOs, and GWQS, respectively.

TurnKey conducted an Additional Subsurface Investigation at the Site in June 2008. This investigation was performed to further assess upgradient and downgradient groundwater quality following the identification of chlorinated-impacts to site groundwater during previous investigations.

An Active Subslab Depressurization (ASD) System IRM Work Plan was prepared by TurnKey and submitted to the NYSDEC for review and approval in August 2010. The ASD IRM Work Plan details the system design and installation, post-installation confirmation testing procedures, and the system operation, maintenance and monitoring.



In September 2010, eight soil vapor samples including a background ambient and QA/QC Blind Duplicate, were collected and analyzed to determine the presence of cVOC vapors on the Site. The subsurface soil vapor sampling points, identified as SV-1 through SV-8, were located around the Site perimeter and, when possible, in close proximity to known or suspected utility trenches. Following sample collection, the Summa canisters were shipped to an NYSDOH-approved laboratory for analysis of USEPA TCL VOCs in accordance with USEPA Method TO-15.Between 2010 and 2012, TurnKey completed the Remedial Investigation and prepared a Remedial Investigation /Alternatives Analysis Report to more fully characterize the Site in accordance with the BCP requirements. The RI included the advancement of soil borings and installation of monitoring wells and piezometers to assess soil and groundwater at greater depths than previous investigations, collection of surface soil samples, and a soil vapor investigation.

In March 2014, a Remedial Action Work Plan (RAWP) was submitted to the NYSDEC, which included: details of the in-Situ groundwater treatment injection program, post-injection groundwater monitoring, remedial excavation; and placement of cover system in areas without building or hardscape e.g., asphalt, concrete).

Remedial activities including the IRM and RA were completed between February and November 2014. Details of the RA are included in Section 1.4 below.

1.2.3 Geologic Conditions

1.2.3.1 Overburden

Shallow surface soils at the Site, present beneath asphalt and/or the building, were generally characterized during the RI as a thin layer of non-native soil/fill materials overlying reddish brown clayey silt (by others), sandy silt, or sandy lean clay, with some fine sand and trace coarse grained sand, especially towards the southwest. The soil/fill materials consist of miscellaneous silt, sand, and gravel at depths of 0-1.5 fbgs, presumably sub-base for the asphalt and/or building. Stratified native clayey silt/sandy silt/sandy lean clay soils were encountered from approximately 1.5 to 20 fbgs.



1.2.3.2 Bedrock

Borehole data collected during the RI coupled with a geotechnical investigation and historic investigations, by others as referenced above, generally indicate split-spoon and auger refusal between 20 and 31 fbgs, suspected to be top of bedrock (e.g., Silurian dolostone). Based on data collected during the RI borehole drilling program, the top of bedrock structure indicates an erosional surface that generally dips in a northerly direction.

1.2.3.3 Hydrogeology

Vertical gradients were determined using water levels measured at the shallow and deep well couplets. The gradient calculations indicate a slight downward component that ranged from 0.11 ft/ft at the MW-103/MW-1D couplet to 0.48 ft/ft at the MW-106/MW-5D couplet during September 2010. Similarly, vertical gradient calculations ranged from 0.12 ft/ft to 0.39 ft/ft at those same well couplets during May 2011.

As defined above, horizontal gradients were calculated for both shallow and deep flow regimes based on data collected during the September 2010 and May 2011 sampling events. For shallow wells, the gradients were determined from the highest elevation at MW-106 (northeast) toward the lowest elevation recorded at MW-103 in the western portion of the Site. The horizontal gradient for shallow groundwater was calculated to be 0.013 ft/ft in September 2010 and 0.021 ft/ft in May 2011. The horizontal gradient(s) determined for deep overburden groundwater were based on measurements recorded at deep monitoring wells MW-1D and MW-5D. The horizontal gradient for deep groundwater was calculated to be 0.009 ft/ft in September 2010 and 0.003 ft/ft in May 2011.

The hydraulic conductivity of the shallow and deep unconfined groundwater units were determined via slug testing in shallow monitoring wells MW-3, MW-103, and MW-106 as well as deep monitoring well MW-4D. The average hydraulic conductivity was estimated to be $1.80 \ge 10^{-5}$ cm/sec (0.051 ft/day) and $2.77 \ge 10^{-5}$ cm/sec (0.079 ft/day) for the shallow and deep groundwater, respectively, using the Bouwer and Rice Method.

Figure 3 depicts the groundwater isopotential map for the Site.



1.3 Summary of Remedial Investigation Findings

A remedial investigation was performed to more fully characterize the nature and extent of contamination at the Site. The results of the investigation are described in detail in the following report:

• TurnKey Environmental Restoration, LLC. Remedial Investigation/Alternatives Analysis Report; 500 South Union Street Site, Spencerport, New York, November 2012.

The purpose of the investigation was to more fully define the nature and extent of contamination on the BCP Site, and to collect data of sufficient quantity and quality to perform the remedial alternatives evaluation. The field investigations were completed across the BCP Site to delineate areas requiring remediation. On-Site field activities included surface and subsurface soil sampling, monitoring well installation, groundwater sampling, air sampling, and collection of hydrogeologic data.

Below is a summary of site conditions when the RI was completed between 2010 and 2012.

1.3.1 Soil/Fill

- Based on surface soil sampling results, no exceedance of Commercial Use SCOs was detected for VOCs, metals, PCBs, pesticides and herbicides. One SVOC, benzo(a)pyrene was detected above its Commercial Use SCO (1.5 mg/kg vs. 1.0 mg/kg CSCO), but well below the Protection of Groundwater SCO (22 mg/kg) at surface soil sample locations SS-1 and SS-3. Lead and zinc were detected at concentrations slightly above their Unrestricted Use SCOs. The concentrations of 4,4'-DDE and 4,4'-DDT detected in SS-3 were slightly above their respective Unrestricted Use SCOs (See Table 1).
- Based on subsurface soil data, no exceedance of Commercial Use SCOs was detected for VOC, SVOCs, metals, PCBs, pesticides and herbicides. Four historic samples exceeded the Protection of Groundwater SCOs for one or more compounds; however, the concentrations were within one order of magnitude of the SCOs. PCE was the only compound detected above its Protection of Groundwater SCO with the



highest concentration of PCE (14.67 mg/kg) was detected in a saturated soil sample B101 (8-10 fbgs) collected during a 1998 investigation (see Table 1).

1.3.2 Groundwater

- Groundwater samples were collected from piezometers and monitoring wells completed in the shallow and deep saturated overburden deposits beneath the Site. Groundwater samples were collected from MW-103, MW-106, MW-1D, MW-2D, MW-3, MW-4D, and MW-5D that comprise the existing Site monitoring well network (see Table 2 and Figure 3).
- Based on RI and historical data, SVOCs and inorganic compounds in groundwater are not considered to be of concern at the Site. Laboratory analytical results indicate that the groundwater is impacted by cVOCs. PCE and breakdown products TCE, cis-1,2-DCE, and VC were determined to be the principal contaminants of concern (COCs) as they were consistently detected at concentrations above the GWQS of 5 µg/L. Detected concentrations ranged from non-detect (ND) (PZ-3) to a maximum 4,000 µg/L (PZ-5). Of the 14 locations sampled, PCE was detected at 11 locations at a concentration greater than the GWQS of 5 µg/L. Daughter products of PCE, including TCE and cis-1,2-DCE, were also observed in shallow and deep groundwater at concentrations above their respective GWQSs. VC, another daughter product of PCE, was present at concentrations exceeding its GWQS in three shallow groundwater locations (PZ-3, PZ-6, and MW-3) and only detected at one deep groundwater location (MW-2D) at a concentration well below its GWQS/GV (see Table 2)

1.3.3 Soil Vapor

Several VOCs were detected in the ambient outdoor air sample as well as each of the eight perimeter subsurface soil vapor samples designated as Ambient and SV-1 through SV-8, respectively. Individual VOC concentrations ranged from non-detect (ND) (several locations) to 980 ug/m³ (SV-7). PCE was detected at soil vapor locations SV-1, SV-2, and SV-3, all along the northern and northeastern portion of the Site. Among the daughter products: TCE, cis-1,2-DCE, and VC were detected at



soil vapor location SV-3; cis-1,2-DCE was also detected at location SV-6 on the southwestern portion of the Site (see Table 3).

The results of the investigation, as described above, indicated that historic operations at the Site impacted on-Site soil with polycyclic aromatic hydrocarbons (PAHs), and on-Site groundwater and soil vapor with volatile organic compounds (VOCs) above the regulatory guidelines and required remediation.

1.4 Summary of Remedial Actions

The site was remediated in accordance with the NYSDEC-approved Remedial Action Work Plan, dated March 2014 and the Active Subslab Depressurization (ASD) IRM Work Plan revised August 2010.

The following is a summary of the Remedial Actions performed and to be performed at the site:

- Installation of ASD system within the existing building, in accordance with the approved ASD IRM Work Plan. The ASD system includes 18 extraction/suction points manifolded to four (4) independent extraction fans. Locations of the extraction points, piping and vent stacks are shown on Figure 4.
- Injection program (Figure 5) was completed in June 2014, in accordance with the Remedial Action Work Plan (March 2014). The in-situ enhanced biodegradation treatment included the direct injection of approximately 21,000 lbs. of Regenesis 3DME at 71 injection points located across the Site (see Figure 5). Details of the injection program are provided in the Final Engineering Report.
- Limited Excavation of soil/fill exceeding Commercial Use SCOs along the northern, southern and eastern property boundaries to approximately 12 inches below grade. Remedial excavation was completed in August and September 2014. Figure 6 shown the approximate extents of the excavation. In total, 219 tons of nonhazardous soil/fill was excavated, loaded and transported off-site for disposal.
- Construction and maintenance of a composite cover system, including areas of the Site covered by the existing building, concrete sidewalk; asphalt parking and driveways; gravel and vegetated soil cover areas. Location and cover system type and related detail are shown on Figure 7. Areas of the Site not covered by buildings and/or impermeable cover (i.e., concrete and asphalt),



are covered by a minimum 12-inch of approved backfill and/or topsoil. Preand post-elevation data is shown on Figure 7.

- Execution and recording of an Environmental Easement to restrict land use to commercial/industrial operations and prevent future exposure to any contamination remaining at the site.
- Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed in November 2014.

1.4.1 Removal of Contaminated Materials from the Site

The 500 South Union Street Site was remediated to remove contaminated soil and achieve Commercial Use SCOs. Table 4 presents a list of the Part 375 Commercial Use SCOs (Track 4) utilized for this Site. Materials removed from the Site are detailed below.

Table 5 shows the total quantities of each category of material removed from the Site and the disposal locations. Figure 6 shows the approximate extents of the excavations and the backfill areas.

1.4.2 Drum removal

Thirteen drums of investigation-derived waste were transported off-site by Freehold Cartage, Inc., to Michigan Disposal Waste Treatment Plant, located in Bellville, MI.

1.4.3 Remedial Soil/Fill Excavation

During remedial excavation activities, completed in August and September 2014, approximately 219-tons of non-hazardous soil/fill was excavated, loaded and transported off-site by Silvarole Trucking, for disposal at Waste Management's Mill Seat Landfill, located in Bergen, NY. Table 5 shows the total quantities of each category of material removed from the Site, the transporter's name and license number, and the disposal locations. As indicated above, Figure 6 shows the approximate extents of the remedial excavation and backfill areas.



1.4.4 Site-Related Treatment Systems

1.4.4.1 Active Subslab Depressurization System

An ASD system creates a low-pressure zone beneath a building slab using a powered fan connected via piping to create a negative pressure beneath the building foundation. The low pressure field prevents soil gas from entering the building. The ASD system used for this project was designed in accordance with the EPA design document entitled "Radon Prevention in the Design and Construction of Schools and Other Large Buildings" Third Printing with Addendum, June 1994 and the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006.

Results of the pre-design field testing completed at the existing building were used to determine the final ASD system design. The installation of the ASD system was completed in March 2014 by Mitigation Tech, in accordance with the approved Work Plan. Details and location of the ASD System components are presented on Figure 4. An ASD system inspection form is provided in Appendix E. This information will be included in the annual periodic review report provided to the NYSDEC.

1.4.4.2 In-Situ Groundwater Treatment Injection

In June 2014, in-Situ groundwater treatment was completed to address cVOC contaminants exceeding GWQS in Site groundwater. The enhanced bioremediation included the direct injection of 21,200 lbs. of Regenesis 3DME[®]. The 3DME facilitates anaerobic bioremediation by slow hydrolysis of the lactic acid that release hydrogen when metabolized by naturally-occurring microbes. The resulting hydrogen is then used in a microbially mediated process known as reductive dechlorination. 3DME produces a sequential, staged release of its electron donor components; this staged fermentation provides an immediate, mid-range and long-term, controlled-release supply of hydrogen (electron donor) to fuel the reductive dechlorination process.

Details of the groundwater treatment injection are provided in the Final Engineering Report. Figure 5 presents the approximate location of the injection points. Post-injection groundwater monitoring schedule is discussed below.



1.4.5 Remaining Contamination

The 500 South Union Street Site was remediated to address cVOC impact groundwater, remove PAH impacted soil/fill, and achieve a Track 4 Commercial Use cleanup, which is consistent with the intended use of the site. Residual contamination remaining at the Site above Unrestricted Use SCOs and GWQS, include residual cVOCs in groundwater to the groundwater interface (approximately 3.5 to 12.5 fbgs), and PAH impacted soil/fill located beneath the cover system demarcation layer. Constituents above regulatory guidelines are located site-wide, though potential exposure to the remaining contamination was mitigated due to the depth of the remaining contamination after the completion of the remedial groundwater injection, completion of the excavation, installation of remedial systems (i.e., ASD system), and the placement of a Site cover system, including the existing building, concrete and asphalt covered areas, gravel, and vegetated soil cover areas.

1.4.5.1 Soil/Fill

The 500 South Union Street Site was remediated to achieve Commercial Use SCOs, which is consistent with the intended use of the Site. When the excavation was deemed complete a demarcation layer, consisting of an orange plastic mesh material, was placed to identify material being left in-place, from the overlying approved clean backfill. Areas of the Site which were not covered by impermeable cover (i.e., building, concrete or asphalt), were backfilled with the required 12-inch thick clean topsoil and/or gravel/stone (including crushed concrete) above the demarcation layer to identify the clean backfill from the remaining underlying soil/fill. Figure 6 shows the approximate extents of the remedial excavation and the backfill areas and cover system detail.

Concentrations of residual contaminants above Part 375 Unrestricted Use SCOs in on-Site soil is summarized on Table 1 and shown on Figure 8.

1.4.5.2 Groundwater

Post-injection groundwater monitoring completed in August and December 2014, indicates that the remedial injection is working, as evidence by the reduction in dissolved oxygen (DO) and transition from a positive to negative oxidation-reduction potential (ORP), and decrease in cVOC concentrations, indicating biodegradation is ongoing (see Table 2).



Figure 5 shows the approximate location of the 71 injection points completed across the Site, and Figure 3 shows the monitoring well locations and isopotential map for the Site.

Elevated cVOCs groundwater concentrations are still present in Site groundwater, however, based on the short time period after completion of the remedial injection, it is expected that cVOC concentrations will continue to decrease. The next post-injection monitoring event is scheduled for the first quarter of 2015. A summary of the residual groundwater contaminants above GWQS in Site groundwater is presented on Table 2. Location of groundwater monitoring wells is shown on Figure 3.

1.4.5.3 Soil Vapor

An ASD system was installed within the existing building to minimize potential exposure to residual contamination in soil vapor and is protective of human health. The ASD System has been operating since April 2014. The ASD system layout is shown on Figure 4.



2.0 ENGINEERING & INSTITUTIONAL CONTROL PLAN

2.1 Introduction

2.1.1 General

Since remaining contaminated soil, groundwater and soil vapor exists beneath the site, Engineering Controls and Institutional Controls (EC/ICs) are required to protect human health and the environment. This Engineering and Institutional Control 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 for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- 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 Cover System

Exposure to remaining contamination in soil/fill at the site is prevented by a composite cover system placed over the site. This composite cover system is comprised of the existing building, concrete sidewalks, asphalt parking and driveways, and 12-inches of approved clean backfill material. Location and cover system type and related detail are shown on Figure 7.

Upon completion of the excavation, a demarcation layer was installed to identify material being left-in-place prior to backfilling. After installation of the demarcation layer, 12 inches of Department approved clean backfill material was placed on top of the demarcation layer. Figure 7 presents the location and detail for the cover system.

The Excavation Work Plan (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 Monitoring Plan included in Section 3 of this SMP.

2.2.2 Active Subslab Depressurization (ASD) System

An ASD system creates a low-pressure zone beneath a building slab using a powered fan connected via piping to create a negative pressure beneath the building foundation. The low pressure field prevents soil gas from entering the building. The ASD system used for this project was designed in accordance with the EPA design document entitled "Radon Prevention in the Design and Construction of Schools and Other Large Buildings" Third Printing with Addendum, June 1994 and the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006.

The installation of the ASD system was completed in March 2014 by Mitigation Tech, in accordance with the approved Work Plan. Details of the ASD system are presented on Figure 4. A total of eighteen (18) subslab extraction points were installed throughout the existing building. At each extraction point, three-inch (3") Sch. 40 PVC piping was run vertically to the ceiling rafters and manifold connected to one of the four extraction fans, specifically, three (3) RADONAWAY RP-265 in-line fan (Fan Systems F1, F2, and F3) and a



RADONAWAY GP-501 centrifugal fan (Fan System F4). Vent stacks were extended/exhausted through the wall of the building. All extraction point piping was sealed with urethane sealant at the concrete slab penetrations. Individual extraction fans can be switched either from the sidewall positioned disconnect or at the individual electrical breaker. All fan system are equipped with vacuum pressure gauges designed primarily to give a simple visual check that sufficient vacuum is present in the riser pipe. Fan Systems F1, F2, and F4 are equipped with oil filled U-tube style manometers, and F3 is a Dwyer magnahelic gauge. All four (4) fans system are tied into the amber warning beacon, which is located in the hallway with F2, F3, and F4 pressure gauges, to signal system failure.

A summary of fan systems and associated pressure gauges in relation to the existing building is provided below.

- Fan System 1 (aka F1; vacuum indicator labeled as Hair Nail Salon) is associated with the two northernmost tenant spaces (Hair and Nail salons.
- Fan System 2 (aka F2; vacuum indicator labeled as Dry Clean Pontillo) is associated with the dry cleaner and Pontillos tenant spaces.
- Fan System 3 (aka F3; vacuum indicator labeled as Restaurant (East) Mangia Mangia) is associated with the southeastern portion of the building.
- Fan System 4 (aka F4; vacuum indicator labeled as Restaurant (west) is associated with the southwestern portion of the tenant space.

After completion of the ASD System, communication testing was completed to verify a negative pressure under the new building concrete slab. A total of eleven (11) testing points were evaluated throughout the building to confirm measurable vacuum, with vacuum readings ranging from 0.004 to 0.145 inches of water Column (in WC). Communication testing point locations are shown on Figure 4.

Procedures for monitoring the ASD system are included in the Monitoring Plan (Section 3 of this SMP). Procedures for operating and maintaining the ASD system are documented in the Operation and Maintenance Plan (Section 4 of this SMP).



2.3 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 6.6 of NYSDEC DER-10.

2.3.1 Composite Cover System

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

2.3.2 Active Sub-slab Depressurization (ASD) System

The ASD system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the ASD system is no longer required, a proposal to discontinue the ASD system will be submitted by the property owner to the NYSDEC and NYSDOH.

2.3.3 Groundwater Monitoring

Groundwater monitoring activities to assess the in-situ ground treatment and longterm 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.

2.4 Institutional Controls

A series of Institutional Controls is required by the Decision Document to: (1) implement, maintain and monitor Engineering Control 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 commercial and/or industrial uses only.



Adherence to these Institutional Controls on the site is required by the Environmental Easement and will be implemented under this Site Management Plan. These Institutional Controls are:

- Compliance with the Environmental Easement and this SMP by the Grantor and the Grantor's successors and assigns;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- All Engineering Controls on the Controlled Property must be inspected at a frequency and in a manner defined in the SMP.
- Groundwater, soil vapor and other environmental or public health 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;

Institutional Controls 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 Institutional Controls in the form of site restrictions. Adherence to these Institutional Controls is required by the Environmental Easement. Site restrictions that apply to the Controlled Property are:

- The property may only be used for commercial and industrial use provided that the long-term Engineering and Institutional Controls included in this SMP are employed.
- The property may not be used for a higher level of use, such as unrestricted, residential, and restricted-residential 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, and is prohibited without NYSDOH and Monroe County DOH approval;



- The potential for vapor intrusion must be evaluated for any additional buildings developed on-site, 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.

2.4.1 Excavation Work Plan

The site has been remediated for commercial use. Notification will be provided to the Department at least 15 days prior to 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 Excavation Work Plan (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 C to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. 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 updated and re-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 (see 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 excavation de-water, 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 engineering controls described in this SMP.

2.4.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any new enclosed structures located on-site, a soil vapor intrusion (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 will 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 NYSDOH for approval. This work plan will 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. Any SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

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.

If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.



2.5 Inspections and Notifications

2.5.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. 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 Engineering Controls 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; and
- Changes, or needed changes, to the remedial or monitoring system;

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 five 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.

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

2.5.2 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 Brownfield Cleanup Agreement (BCA), 6NYCRR Part 375, and/or Environmental Conservation Law.



- 15-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.
- 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 Engineering Controls and likewise any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day (following safe site accessibility) of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the site, with written confirmation within 7 days that includes 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 the Brownfield Cleanup Agreement (BCA), and 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.

2.6 Contingency Plan

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

This Contingency Plan, a summary of the Emergency Response Plan is appended to the HASP (see Appendix C), describes potential emergencies that may occur at the Site; procedures for responding to those emergencies; roles and responsibilities during emergency



response; and training all workers must receive in order to follow emergency procedures. This Contingency Plan 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.

2.6.1 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 a qualified environmental professional. These emergency contact lists must be maintained in an easily accessible location at the site.

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

Table 6: Emergency Contact Numbers

Table 7: Contact Numbers

Eyezon Associates, I	Inc.	Bob Spencer, (585)-738-2360
TurnKey Restoration, LLC	Environmental	(716) 856-0635

* Note: Contact numbers subject to change and should be updated as necessary



2.6.2 Map and Directions to Nearest Health Facility

Site Location: 500 South Union Street Site

Nearest Hospital Name: Strong Memorial Hospital (ER)

Hospital Location: 601 Elmwood Avenue, Rochester, NY 14642

Hospital Telephone: 585-275-4551

Directions to the Hospital:

- 1. Travel south on South Union Street (NY-259) toward Nichols St. (NY-31)
- 2. Merge onto NY-531 (Spencerport Expressway) toward I-490
- 3. Take the I-490E Rochester exit to the left onto I-490E
- 4. Take Exit 9B (I-390S/Airport) onto I-390S
- 5. Take Exit 17 (RT-383/Scottsville Rd)
- 6. Turn Left onto Scottsville Rd (RT-383)
- 7. Continue on Elmwood Ave
- 8. Turn Left to stay on Elmwood Ave
- 9. The hospital is on the right at 601 Elmwood Ave.
- 10. Follow signs to the ER

Total Distance: 12 miles Total Estimated Time: 20 minutes

Figure A1 (included in SMP Appendix C – HASP) presents a Hospital Route Map and written directions to the facility.

2.6.3 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 (Table 7, above). An emergency telephone list will also be posted prominently at the site and made readily available to all personnel at all times. An Emergency Response Plan is included as Appendix A-1 of the HASP (Appendix C of the SMP).



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 cover system, and all affected site media identified below. Monitoring of other Engineering Controls 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 and soils);;
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and 6NYCRR 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; and,
- 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/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;



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

Tri-annual (3-times per year) groundwater monitoring of the performance of the remedy and overall reduction in contamination on-site will be conducted for the first and second year post-COC. The frequency thereafter will be determined in consultation with the 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 Table 9 and outlined in detail in Sections 3.2 and 3.3 below.

Monitoring of the performance of the remedy and overall reduction in contamination will be conducted in accordance with Table 9. Contaminant level trends in 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 Table 10 and outlined in detail in Sections 3.2 and 3.3 below.

Monitoring Program	Frequency*	Matrix	Analysis
EC Inspections (ASD)	Monthly Readings		
Cover System	Annual		
Groundwater	Tri-annual (3-times per year)	Water	TCL VOCs

Table 8: Monitoring/Inspection Schedule

 \ast The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 Cover System Monitoring

Site-wide inspection of the composite cover system, as described above, will be performed annually in association with the PRR, and will also be performed after all severe



weather conditions that may affect the cover system. The site-wide inspection form is provided in Appendix E.

The site-wide inspection will include a general visual evaluation of all areas of the Site. Non-paved areas (e.g. vegetated areas), concrete and asphalt paved areas, and gravel/stone areas across the Site will be inspected for erosion, absence of vegetation, and condition of impermeable surfaces (i.e., asphalt and concrete) to verify that these areas are being maintained, as appropriate to prevent direct contact with remaining contamination and potential off-site migration of remaining contaminants by surface water run-off. Any surface or subsurface disturbances related to redevelopment activities will be performed in compliance with the Excavation Work Plan (Appendix A).

3.3 Media Monitoring Program

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. Specifically, the groundwater monitoring network, identified as MW-103, MW-106, MW-1D, MW-2D, MW-3, MW-4D, MW-5D, PZ-5 and PZ-8, will be sampled and analyzed on a tri-annual basis for a minimum of 2 years (i.e., 6 events), after which time a request may be made to the Department to modify the sampling frequency by the Site owner. Samples will be collected and analyzed as discussed below. Figure 3 is a groundwater isopotential map showing the approximate direction of groundwater flow. Well depths and screened intervals for the groundwater monitoring well network are provided below. Monitoring well construction logs are included in Appendix D.

Well ID	Depth of Well (feet below grade)	Screened Interval (feet below grade)
MW-1D	25	20-25
MW-2D	22	12-22
MW-3	19.2	9.7-19.2
MW-4D	27.5	17.5-27.5
MW-5D	30.8	20.8-30.8



PZ-5	15	10-15
PZ-8	12	2-12
MW-103	17	7-17
MW-106	17	7-17

The sampling frequency may be modified with the approval of the NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC. Groundwater data will be provided to the NYSDEC in an electronic letter-report after each monitoring event and the laboratory analytical results presented in a summary table showing previous sampling results. Results of the groundwater monitoring events will be included in the PRR.

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 E. 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.

The groundwater sampling program will consist of post-treatment monitoring in MW-103, MW-106, MW-1D, MW-2D, MW-3, MW-4D, MW-5D, PZ-5 and PZ-8 (see Figure 3). Groundwater samples for VOCs and field parameters will be collected using passive diffusion bags (PDBs), and samples for attenuation parameters will be collected using rigid porous polyethylene (RPP) samples. Attenuation parameters to evaluate effectiveness of the in-situ treatment including, dissolved iron, manganese, sulfate, nitrate-nitrite, and dissolved gases including methane, ethane, and ethene, will be collected from RPP sampler locations.

Laboratory supplied pre-filled PDBs and RPPs will be used in the groundwater monitoring network. Product information on PDBs and RPPs is included in Appendix F.

PDBs are polyethylene tubes or bags filled with analyte-free water that operate by diffusion of contaminants across the membrane. PDBs are well suited for sampling residual VOCs in groundwater. RPPs are made of thin sheets of foam-like porous polyethylene that are filled with analyte-free water and facilitate a water-water interface within the well allowing equilibrium of water-soluble analytes. RPPs are well suited for sampling dissolved metals



and select attenuation parameters in groundwater at the Site. Both PDBs and RPPs are deployed on custom built sampling harnesses that position the samplers proximate to the screened interval of the well.

PDBs and RPPs will be deployed and left in-place (submerged) for a minimum of two (2) weeks (14-days) prior to retrieval and sampling. Samplers (PDBs/RPPs) are retrieved from the well, and the contents are poured into the laboratory supplied sample containers. PDB samplers are typically cut, using decontaminated scissors, on an angle at the end of the PDB, and the contents poured off into the laboratory supplied sample containers. Note, VOC samples need to be transferred from the PDB to appropriate sample vials in less than 30 minutes from being removed from the well. RPP samplers are retrieved vertically from the well with the plug facing down. Cut the protective mesh at the top and bottom and remove the sampler, keeping the same vertical orientation. Pour off the contents of the sampler into the sample container by inverting the sampler, turning the plug and collecting the contents. Any excess water volume from the PDBs and RPPs will be used to collect field parameters including pH, conductivity, temperature, turbidity, dissolved oxygen, and oxidation-reduction potential (ORP). If excess water still remains after collection of field parameters, the water will be returned to the well from which it was removed to continue in-Situ treatment, as the reagent (3DME) has an expected life-cycle within the subsurface of up to four (4) years.

Laboratory samples will be transported under chain-of-custody command to an Environmental Laboratory Approval Program (ELAP)-certified laboratory. A Category B laboratory analytical report will be provided to allow for third-party data validation. Laboratory analytical results and field parameters values will be summarized and provided to the Department with the monitoring reports.

3.3.1.2 Monitoring Well Repairs, Replacement & Decommissioning

If biofouling or silt accumulation occurs in the on-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. 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 CP-43: Groundwater Monitoring Well Decommissioning Policy. 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.

3.3.2 ASD System Monitoring

The Site Owner will perform ASD system monitoring. A representative of the Site Owner will record the vacuum (in H_2O) at each extraction point on a monthly basis using the form in Appendix E to confirm that adequate depressurization is occurring. Table 8 (in text) presents the schedule for the ASD system monitoring program. Figure 4 provides a layout of the system depicting the piping, fan locations, and extraction and testing points.

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 EC/ICs or monitoring devices. During the annual inspections, the NYSDEC auto-generated certification form will be completed (Appendix E). 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; and
- 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 G). The 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;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules;
- Corrective Action Measures.



3.6 Monitoring Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections will be kept on file by the site owner or its designated representative and on-site. 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 PRR as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the PRR. An electronic letter report will also be prepared subsequent to each groundwater monitoring event. The letter report 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 (o be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- 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 Table 9 below.



Task	Reporting Frequency*					
PRR	Annual					
Cover System	Annual and after a major event (natural or man- made)					
Groundwater Monitoring	Tri-annual for first two (2) years (electronically) The groundwater monitoring network will be inspected during each groundwater sampling event or after a major event (natural or man-made).					
Groundwater Monitoring Letter Reports	Subsequent to each monitoring/sampling event.					
ASD System	Monthly inspections of the ASD System and warning system or after a major event (natural or man-made, to include the ASD Log)/Report with PRR					

Table 9: Schedule of Monitoring/Inspection Reports

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC.



4.0 **OPERATION & MAINTENANCE PLAN**

4.1 Introduction

This Operation and Maintenance Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the site. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the site to operate and maintain the ASD system;
- Includes an operation and maintenance contingency plan; and,
- Will be updated periodically to reflect changes in site conditions or the manner in which the ASD system is operated and maintained.

A copy of this Operation and Maintenance Plan, included within the SMP, will be kept at the site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

4.2 Engineering Control System Operation & Maintenance

4.2.1 Active Subslab Depressurization System

Components of the ASD System include:

- Sealing of all major slab and foundation penetrations, including joints, cracks, and utility penetrations;
- Eighteen subslab extraction points beneath the building slab;
- Four independent SSD systems with 18 subslab extraction points beneath the slab;
- Four vent stack assemblies from the extraction points to the exterior of the building; and,
- Continuous operation of four exhaust fans each equipped with oil filled Utube style manometer or magnahelic vacuum pressure gauges. The system is also equipped with an amber warning beacon to signal system failure.

4.2.2 Initial ASD System Start-Up and Testing

The following procedure was followed for the start-up of the ASD system completed in March 2014, and should be followed in the event the system needs to be restarted.

Upon start-up of the ASD system, a "normal" operating pressure should be established by recording the displayed pressure approximately four hours after initial system start-up. Another reading should be taken and recorded after approximately one week of operation to check if significant changes in pressure readings are observed relative to the initial "normal" operating pressure. If there are no significant pressure differences from the "normal" operating pressure, the ASD system will be inspected on a monthly basis as described below.

If pressure readings are more than 25-50% out of range, the individual system components for those extraction assemblies will be inspected for blockage and/or damage. If an extraction assemblage cannot be brought on-line properly based on the inspection, or no apparent cause is observed, a qualified vapor mitigation contractor will be contacted immediately to schedule a Site visit to inspect and trouble-shoot the system.

The ASD system was installed by licensed contractor, as described in the Final Engineering Report. After completion of the ASD System, communication testing was completed to verify a negative pressure under the new building concrete slab. A total of 11 testing points were evaluated throughout the building to confirm measurable vacuum, with vacuum readings ranging from 0.004 to 0.145 inches of water Column (in WC). Communication testing point locations are shown on Figure 4.

4.2.2.1 ASD System Restart Procedure and Testing

The following procedure should be followed to restart the ASD System, in association with the initial startup described above.

Each of the four (4) ASD System extraction fans operates independent of each other, therefore, these start-up steps apply to each fan assemblage.

ASD System Start up Procedure

- Verify electrical connection for the appropriate extraction fan at the circuit breaker. If unable to energize beaker, call qualified electrician. Do not open the electrical panel, unless you are a qualified electrician.
- Turn "on" the appropriate extraction fan electrical switch.



- Confirm extraction fan operation, as indicated by the vacuum gauge readings.
- After approximately 4-hours, confirm "normal" operating pressure as compared to historic readings
- One week (7-days) after restart, confirm vacuum readings
- If normal readings are confirmed, return to monthly system inspections.
- If an extraction assemblage cannot be brought on-line properly based on the inspection, or no apparent cause is observed, a qualified vapor mitigation contractor will be contacted immediately to schedule a Site visit to inspect and trouble-shoot the system, and notify the NYSDEC PM.

4.2.3 ASD System Operation

The ASD system was designed for continuous operation with minimal maintenance and/or operational oversight. It is imperative, however, that the system be inspected periodically to document operation.

At each extraction point, three-inch (3") Sch. 40 PVC piping was run vertically to the ceiling rafters and connected to either a RADONAWAY RP-265 in-line fan (Fan Systems 1,2, and 3) and a RADONAWAY GP-501 centrifugal fan (Fan System 4), extended through the exterior wall. The four extraction assemblages are equipped with vacuum pressure gauges to allow for visual inspection and verification of vacuum (see Figure 4).

4.2.4 Non-Routine Equipment Maintenance

The ASD system components (see Figure 4) are no-maintenance components. The mechanical components, including extraction fans, vacuum gauges and indicators, and pitot tubes do not require routine maintenance. With the exception of the extraction fans, if it is determined during the routine inspections that a component of the ASD system is malfunctioning, the Department will be notified, and a replacement part will be ordered and installed. The Department will be notified upon installation of the replacement part and ASD system operation. Regarding the extraction fans, if it is determined that a fan is malfunctioning, and not the results of power loss, a qualified electrician or fan technician will be notified to inspect and/or replace the extraction fan. The Department will be notified



once the extraction fan is fixed and/or replaced. Any corrective actions will be noted on the inspection form and PRR.

4.2.5 Monthly Performance Monitoring

On a monthly basis, the pressure gauges at each extraction assemblage will be visually inspected and recorded to document that the system is maintaining negative pressure beneath the building slab. Any large fluctuations (i.e., beyond the range of normal operating pressures by 25-50%) or trends in pressure will be documented and brought to the attention of the owner/responsible party. The monthly visual inspection will include the complete system, including visible leaks in piping and/or cracks in the concrete slab will be identified and noted for repair, clearance around extraction fans, and monitoring devices. Changes in use of the space, modifications to the system, building renovations, and/or any non-running time will be documented and submitted with the PRR. An ASD system inspection log is provided in Appendix E. This information will be included in the annual PRR provided to the NYSDEC.

It should be noted that the inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the ASD system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the ASD system are specified below.

4.2.6 Annual ASD System Certification/Inspection

An annual system certification/inspection, documenting that the system is performing properly and remains effective, will be performed annual in accordance with the PRR. A Qualified Environmental Professional (QEP), as defined in 6 NYCRR Part 375-1.2(ak), and/or a NYS licensed Professional Engineer (PE), as required by DER-10 (May 2010) will perform the annual inspection and/or certification.

The ASD system annual inspection and certification will include:

Visual inspection of the equipment and piping (Monthly Monitoring);



- Inspect the floor, and slab for cracks (resealing if necessary); smoke tubes may be used to check for leaks through floor joints and at suction points while the depressurization system is running;
- Review of the Site's ASD System Log;
- A visual inspection and recording of vacuum gauge readings;
- Each extraction assembly will be de-energized to confirm that the alarm signals are operating properly; and,
- Re-energize of the system and allow alarm signals to deactivate.

If modification of the ASD system and/or renovation of on-Site building(s) occur during the reporting period, an inspection of the location and distance of air intake structures relative to the stack vents will be completed to ensure they meet minimum distances per NYSDOH guidance.

A complete list of components to be checked is provided on the Inspection Form (Appendix E). If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair, as per the Operation and Maintenance Plan, are required immediately, and the ASD system restarted.



5.0 INSPECTIONS, REPORTING & 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 3.0 (Site Monitoring Plan) and Section 4.0 (Operation and Maintenance Plan) of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components 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, & Maintenance Reports

A NYSDEC Institutional and Engineering Control Certification Form will be completed during the annual site-wide inspection (see Appendix E). These forms are autogenerated by the NYSDEC. Inspection forms and logs from the site cover system and ASD system are also provided in Appendix E.

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 & 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; and, based on the above items,
- The site remedy continues to be protective of public health and the environment and is performing as designed in the IRMWP, RAWP and FER.



5.2 Certification of Engineering and Institutional Controls

After the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State (depending on the need to evaluate engineering systems) will prepare the following certification:

For each institutional and engineering control 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 institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional and engineering control 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 and generally accepted engineering practices; and,
- 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]



Every five years the following certification will be added:

• The assumptions made in the qualitative exposure assessment remain valid.

The signed certification will be included in the PRR as 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, as described in Appendix B (Environmental Easement). The report will be prepared in accordance with NYSDEC DER-10 and submitted within 30 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;
- 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 exceedances 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 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; and
- The overall performance and effectiveness of the remedy.
- A performance summary for the ASD system at the site during the calendar year, including information such as:
 - The number of days the system was run for the reporting period;
 - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
 - o A description of the resolution of performance problems;
 - A summary of the performance, effluent and/or effectiveness monitoring; and
 - o Comments, conclusions, and recommendations based on data evaluation.

The Periodic Review Report will be submitted in electronic format, with the fully executed NYSDEC Institutional and Engineering Control Certification Form submitted in hard-copy format, to the NYSDEC Regional Office in which the site is located (Region 8) and the NYSDOH Bureau of Environmental Exposure Investigation (electronic only).

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 institutional or engineering control, 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.







SUMMARY OF REMAINING ON-SITE SOIL/FILL ABOVE UNRESTRICTED USE SCOS

Site Management Plan 500 South Union Street Site BCP Site Number C828153 Spencerport, New York

Parameter ¹	Unrestricted Use SCOs ²	B101-S4 (8-10)	B104-S4 (6-8)	B105-S1 (0-2)	SB-9 (18-20)	
		11/12/98	11/12/98	11/13/98	03/20/08	
Volatile Organic Compounds (VOCs) - mg/kg						
Acetone	0.05	ND	0.553	ND	0.006 J	
Benzene	0.06	ND	ND	ND	ND	
cis-1,2-Dichloroethene	0.25				0.01	
Ethylbenzene	1	ND	ND	1.4429	ND	
Isopropylbenzene (Cumene)	2.3				ND	
Methylcyclohexane					ND	
Methylene chloride	0.05	ND	ND	ND	0.007	
Tetrachloroethene	1.3	14.67	ND	ND	2.9 D	
Trichloroethene	0.47	ND	ND	ND	0.051	
Total Xylene	0.26	2.86	ND	0.7184	ND	

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.

2. Values per NYSDEC Part 375 Soil Cleanup Objectives (December 2006)

Definitions:

ND = Parameter not detected above laboratory detection limit.

"--" = Sample not analyzed for parameter or no SCO available for the parameter.

J = Estimated value; result is less than the sample quantitation limit but greater than zero.

D = Compounds were identified in an analysis at the secondary dilution factor.

Bold

= Result exceeds 6NYCRR Part 375 Unrestricted Use SCOs.



SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Site Mangement Plan 500 South Union Street Site BCP Site Number C828153 Spencerport, New York

			SAMPLE LOCATIONS																													
PARAMETER ¹	GWQS ²		MW-1D			MM	/-2D			MV	V-3		M	W-4D			MM	/-5D		MW-	103		MW	-106			PZ	2-5			PZ-8	
		09/28/10 05/1	0/11 08/27	7/14 12/01/14	09/28/10	05/10/11	08/27/14	12/01/14	09/28/10	05/10/11	08/27/14 12	2/01/14 09/27/10	05/10/11	08/27/14	12/01/14	09/27/10	05/11/11	08/26/14 12/01/14	09/28/10	05/11/11	08/27/14 12/01/14	09/27/10	05/11/11	08/26/14	12/01/14	09/28/10	05/11/11	08/27/14	12/01/14 09	27/10 05/	1/11 08/27/	14 12/01/14
Volatile Organic Compounds (VOCs) - (u	ıg/L)																															
1,1-Dichloroethene	5	ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND								
2-Butanone (MEK)	50	ND N	D 25 H	H, J	ND	ND	6.8 H, J		ND	ND	ND	ND	ND	12 H		ND	ND	17 J	ND	ND		ND	ND	ND								
4-methyl-2-pentanone (MIBK)		ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND								
Acetone	50	ND N	D 120	H	ND	ND	4.7 H, J		ND	ND	ND	ND	ND	69 H		ND	ND	30	ND	ND		ND	ND	ND								
Carbon disulfide		0.81 J N	D NE	D	ND	ND	0.35 H, J		ND	ND	ND	ND	ND	0.54 H, J		ND	ND	ND	ND	ND		ND	ND	ND								
Chloroethane	5	ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	1.5 H		ND	ND	ND	ND	ND		ND	ND	ND								
Chloroform	7	ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	1.2	ND		ND	ND	ND	ND	ND		ND	ND	ND								
Chloromethane (Methyl chloride)	5	ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND								
cis-1,2-Dichloroethene	5	6.7 6	NE	D	11	15	15 H		2000 D	1700	3800 H	1.7	ND	ND		ND	ND	ND	1.9	ND		0.84 J	ND	ND								
Dichlorodifluoromethane (Freon-12)	5	ND N	D NE	D	ND	ND	ND		ND	ND	ND	1	ND	ND		ND	ND	ND	ND	ND		3.2	ND	ND								
Methyl tert butyl ether (MTBE)		ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	ND		1 J	ND	ND	ND	ND		ND	ND	ND								
Tetrachloroethene	5	12 1	3 3.3 ⊢	H, J	1400 D	2000 D	860 H		40 D,J	ND	340 H	1800 D	1900 D	730 H		120 D	140 D	7.8	2.4	ND		270 D	160	72								
Toluene	5	ND N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND								
trans-1,2-Dichloroethene	5	3.5 N	D NE	D	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND								
Trichloroethene	5	2 N	D NE	D	33	53	34 H		62 D	32	380 H	5.9	ND	2.5 H		ND	ND	ND	2.4	ND		ND	ND	ND								
Vinyl chloride	2	ND N	D NE	D	1.4	ND	ND		ND	38	210 H	ND	ND	ND		ND	ND	ND	ND	ND		ND	ND	ND								
Total VOCs		25.01 2	4 148	3.3	1445.4	2068	920.85		2102	1770	4730	1808.6	1901.2	815.54		121	145.9	54.8	6.7	0		274.04	160	72								
Total cVOCs		24.2 2	4 3.3	3	1445.4	2068	909		2102	1770	4730	1807.6	1900	732.5		120	140	7.8	6.7	0		270.84	160	72								
Field Measurements (Units as Indicated)		· · · · · · · · · · · · · · · · · · ·																														
pH (units)	6.5 - 8.5	7.03 6.8	35 5.9	91	7.05	6.98	6.50		6.56	6.80	6.47	7.40	7.23	6.96		7.54	7.04	6.95	7.14	6.69	6.83	7.44	6.95	7.17		7.40	7.26		7	.11	- 7.02	
Temperature (oC)		19.7 18	.4 18.	.7	21	12.2	16.1		19.4	12	17.7	15.2	13.3	16.1		14.7	19.1	16.4	22	15.2	17.4	17.2	14.1	17.8		21.7	16.7		1	6.9	- 16.7	·
Specific Conductance (uS)		2380 35	53 513	35	3690	3604	3602		2001	2909	2219	1137	1366	2151		1268	1306	1562	4232	5691	1999	1552	2540	1614		19.8	1423		4	57	- 316.	7
Turbidity		38 24	.4 >10	00	67	123	211		25.8	19.9	>1000	151	8.75	84.1		38.1	7.14	>1000	58	19.6	32.6	51	60.4	272		617	803		>1	000	100)
DO (ppm)		3.33 2.1	7 0.2	23	2.26	2.14	0.97		2.94	2.38	0.25	1.63	2.88	0.57		5.78	1.84	0.98	3.41	2.15	0.83	3.78	3.38	1.47		5.94	3.46		4	.47	- 3.5	
ORP (mV)		48 11	0 -10	00	100	117	-86		71	119	-142	84	66	-112		-25	62	-226	0	137	71	54	77	-102		24	10		1	02	82	
Attenuation Factors - (mg/L)																																
Iron, Dissolved			11.	.9			ND				10			0.38				1.3			ND			ND								
Manganese, Dissolved			· 11.	.3			1.8				3.1			1.3				0.51			1.1			0.0063								
Ethane			· NE	D			ND				ND			ND				ND			ND			ND								
Ethene			- NE	D			ND				ND			ND				ND			ND			ND								
Methane			120)]			1.1 J				250			1.8 J				ND			1.5 J			ND								
Nitrate as N			- NE	D			0.28				ND			ND				ND			0.87			1.8								
Sulfate			- NE	D			86				ND			65.7				19.8			144			87								

 Notes:

 1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.

 2. Values per NYSDEC Division of Water Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations - Class GA (TOGS 1.1.1)

 3. -- = No GWQS available or parameter not analyzed for.

 4. H = Sample analyzed beyond the specified holding time.

 5. J = Estimated value.

= Result exceeds GWQS.



SUMMARY OF SOIL VAPOR ANALYTICAL RESULTS

Site Management Plan 500 South Union Street Site BCP Site Number C828153 Spencerport, New York

	Sample Location and Date ^{2,3}											
Parameter ¹	Ambient	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6	SV-7	SV-8			
	09/09/10	09/09/10	09/09/10	09/09/10	09/09/10	09/09/10	09/09/10	09/09/10	09/09/10			
Volatile Organic Compounds (VOCs) - (ug/m³)	-	•	-	-			-				
Acetone	ND	180	300 J	210 J	170 J	130 J	250 J	550	74			
Benzene	ND	ND	17 J	11 J	ND	ND	22 J	38	ND			
1,3-Butadiene	ND	ND	11 J	9.7 J	ND	ND	3.1 J	10	3.5			
Carbon disulfide	ND	ND	ND	19 J	ND	ND	54 J	33	ND			
Chloroform	ND	ND	ND	ND	ND	ND	23 J	ND	ND			
Chloromethane (Methyl chloride)	1.1	ND										
cis-1,2-Dichloroethene	ND	ND	ND	8.5 J	ND	ND	110 J	ND	ND			
Cyclohexane	ND	ND	52 J	23 J	16 J	ND	27 J	140	ND			
Dichlorodifluoromethane (Freon-12)	2.8	ND										
1,1-Dichloroethene	ND	ND	ND	17 J	ND	ND	ND	ND	ND			
1,2-Dichloroethene, Total	ND	ND	ND	22 J	ND	ND	110 J	ND	ND			
Ethylbenzene	ND	14	9.3 J	16 J	ND	ND	9.2 J	37	ND			
m&p-Xylene	ND	36	28 J	44 J	ND	ND	19 NJ	120	ND			
Methyl Butyl Ketone (2-Hexanone)	ND	ND	ND	ND	ND	24 J	ND	ND	ND			
Methyl Ethyl Ketone (2-Butanone)	ND	31	41 J	29 J	34 J	ND	53 J	78	13			
n-Butane	ND	960	950 J	270 J	270 J	37 J	330 J	980	79			
n-Heptane	ND	32	71 J	75 J	31 J	ND	50 J	390	ND			
n-Hexane	ND	18	130 J	88 J	47 J	9.6 J	58 J	300	6.5			
Tetrachloroethene	ND	120	56 J	180 J	ND	ND	ND	ND	ND			
Toluene	1.4 NJ	52	60 NJ	62 NJ	50 NJ	46 J	100 J	150 NJ	18			
trans-1,2-Dichloroethene	ND	ND	ND	14 J	ND	ND	ND	ND	ND			
Trichloroethene	ND	ND	ND	52 J	ND	ND	ND	ND	ND			
Trichlorofluoromethane (Freon-11)	1.3	ND										
Vinyl chloride	ND	ND	ND	6.6 J	ND	ND	ND	ND	ND			
Total Xylene	1.2	48	38 J	60 J	23 J	15 J	23 J	160	7.5			
o-Xylenes	ND	12	10 J	16 J	ND	ND	4.7 NJ	42	ND			

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.

2. Samples for SV-2, SV-3, SV-4, SV-5, and SV-6 were at ambient pressure at sample receipt, with no residual vacuum; there fore the results have been qualified as estimated in volume (e.g., J).

3. The detected result is qualified as tentative in identification and estimated in volume due to very poor mass spectral quality (e.g., NJ).



SUMMARY OF SOIL CLEANUP OBJECTIVES

500 SOUTH UNION STREET SITE BCP SITE NUMBER C828153 SPENCERPORT, NEW YORK

PARAMETER	Commercial Use SCOs ¹					
Volatile Organic Compounds (VOCs) - mg/Kg						
1,1,1-Trichloroethane	500					
1,1-Dichloroethane	240					
1,1-Dichloroethene	500					
1,2-Dichlorobenzene	500					
1,2-Dichloroethane	30					
cis-1,2-Dichloroethene	500					
trans-1,2-Dichloroethene	500					
1,3-Dichlorobenzene	280					
1,4-Dichlorobenzene	130					
1,4-Dioxane	130					
Acetone	500					
Benzene	44					
Butylbenzene	500					
Carbon tetrachloride	22					
Chlorobenzene	500					
Chloroform	350					
Ethylbenzene	390					
Hexachlorobenzene	6					
Methyl ethyl ketone	500					
Methyl tert butyl ether	500					
Methylene chloride	500					
n-Propylbenzene	500					
sec-Butylbenzene	500					
tert-Butylbenzene	500					
Tetrachloroethene	150					
Toluene	500					
Trichloroethene	200					
1,2,4-Trimethylbenzene	190					
1,3,4-Trimethylbenzene	190					
Vinyl chloride	13					
Xylene	500					



SUMMARY OF SOIL CLEANUP OBJECTIVES

500 SOUTH UNION STREET SITE BCP SITE NUMBER C828153 SPENCERPORT, NEW YORK

PARAMETER	Commercial Use SCOs ¹
Semi-Volatile Organic Compounds (SVOCs) - n	ng/Kg
Acenaphthene	500
Acenaphthylene	500
Anthracene	500
Benzo(a)anthracene	5.6
Benzo(a)pyrene	1
Benzo(b)fluoranthene	5.6
Benzo(g,h,i)perylene	500
Benzo(k)fluoranthene	56
Chrysene	56
Dibenzo(a,h)anthracene	0.56
Fluoranthene	500
Fluorene	500
Indeno(1,2,3-cd)pyrene	5.6
m-Cresol	500
Naphthalene	500
o-Cresol	500
p-Cresol	500
Pentachlorophenol	6.7
Phenanthrene	500
Phenol	500
Pyrene	500
Metals - mg/Kg	
Arsenic	16
Barium	400
Beryllium	590
Cadmium	9.3
Chromium, trivalent	1500
Chromium, hexavalent	400
Copper	270
Cyanide	27
Lead	1000
Manganese	10000
Mercury	2.8
Nickel	310
Selenium	1500
Silver	1500
Zinc	10000



SUMMARY OF SOIL CLEANUP OBJECTIVES

500 SOUTH UNION STREET SITE BCP SITE NUMBER C828153 SPENCERPORT, NEW YORK

PARAMETER	Commercial Use SCOs ¹								
Pesticides/Herbicides and PCBs - mg/Kg									
Silvex (2,4,5-TP)	500								
4,4'-DDE	62								
4,4'-DDT	47								
4,4'-DDD	92								
Aldrin	0.68								
alpha-BHC	3.4								
beta-BHC	3								
alpha-Chlordane	24								
delta-BHC	500								
Dibenzofuran	350								
Dieldrin	1.4								
Endosulfan I	200								
Endosulfan II	200								
Endosulfan sulfate	200								
Endrin	89								
Heptachlor	15								
Lindane	9.2								
Polychlorinated biphenyls (PCBs)	1								

Notes:

1. Values per 6NYCRR NYSDEC Part 375 Soil Cleanup Objectives (SCOs).



SUMMARY OF MATERIALS REMOVED FROM THE SITE

SITE MANAGEMENT PLAN 500 SOUTH UNION STREET SITE BCP SITE NUMBER C828153 SPENCERPORT, NEW YORK

Material / Item	Quantity	Units	Responsible Company / EPA ID Number	Treatment and/or Disposal Location
Investigation Derived Waste (Soil)	2	Drums	Hazmat Environmental Group, Inc. / NYD980769947	EQ-Michigan Disposal Waste Treatment Plant, Belleville MI
Investigation Derived Waste (Soil)	9	Drums	Freehold Cartage, Inc. / NJD054126164	EQ-Michigan Disposal Waste Treatment Plant, Belleville MI
Investigation Derived Waste (Liquid - Water)	4	Drums	Freehold Cartage, Inc. / NJD054126164	EQ-Michigan Disposal Waste Treatment Plant, Belleville MI
Surface Soil/fill	219	Tons	TREC Environmental / Salvarole Trucking (8A-190)	Waste Management - Millseat Landfill, Bergen, NY



CRITERIA FOR IMPORTED SOILS BCP SITE NUMBER C828153 500 SOUTH UNION STREET SITE SPENCERPORT, NEW YORK

Parameter	Allowable Concentration for Use of Off-Site Soil
Volatile Organic Compounds (mg	g/kg)
1,1,1-Trichloroethane	0.68
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
1,2-Dichloroethene(cis)	0.25
1,2-Dichloroethene(trans)	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	3.2
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
Propylbenzene-n	3.9
Sec-Butylbenzene	11
Tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47



CRITERIA FOR IMPORTED SOILS BCP SITE NUMBER C828153 500 SOUTH UNION STREET SITE SPENCERPORT, NEW YORK

Parameter	Allowable Concentration for Use of Off-Site Soil
Volatile Organic Compounds (m	g/kg)
Trimethylbenzene-1,2,4	3.6
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6
Semi-Volatile Organic Compoun	ds (mg/kg)
Acenaphthene	98
Acenaphthylene	107
Anthracene	500
Benzo(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1.7
Benzo(g,h,i)perylene	500
Benzo(k)fluoranthene	1.7
Chrysene	1
Dibenz(a,h)anthracene	0.56
Fluoranthene	500
Fluorene	386
Indeno(1,2,3-cd)pyrene	5.6
m-Cresol(s)	0.33
Naphthalene	12
o-Cresol(s)	0.33
p-Cresol(s)	0.33
Pentachlorophenol	0.8
Phenanthrene	500
Phenol	0.33
Pyrene	500



CRITERIA FOR IMPORTED SOILS BCP SITE NUMBER C828153 500 SOUTH UNION STREET SITE SPENCERPORT, NEW YORK

Parameter	Allowable Concentration for Use of Off-Site Soil
Metals (mg/kg)	
Arsenic	16
Barium	400
Beryllium	47
Cadmium	7.5
Chromium, Hexavalent ¹	19
Chromium, Trivalent ¹	1500
Copper	270
Cyanide	27
Lead	450
Manganese	2000
Mercury (total)	0.73
Nickel	130
Selenium	4
Silver	8.3
Zinc	2480
PCBs/Pesticides (mg/kg)	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	17
4,4'-DDT	47
4,4'-DDD	14
Aldrin	0.19
Alpha-BHC	0.02
Beta-BHC	0.09
Chlordane (alpha)	2.9
Delta-BHC	0.25
Dibenzofuran	210
Dieldrin	0.1
Endosulfan I	102
Endosulfan II	102



CRITERIA FOR IMPORTED SOILS BCP SITE NUMBER C828153 500 SOUTH UNION STREET SITE SPENCERPORT, NEW YORK

Parameter	Allowable Concentration for Use of Off-Site Soil								
PCBs/Pesticides (mg/kg)									
Endosulfan sulfate	200								
Endrin	0.06								
Heptachlor	0.38								
Lindane	0.1								
Polychlorinated biphenyls	1								

Notes:

- 1. Values per NYSDEC DER-10 Allowable Constituent Levels for Imported Fill or Soil.
- 2. The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the specific SCO for Hexavalent Chromium.

FIGURES



FIGURE 1



NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF TURNKEY ENVIRONMENTAL RESTORATION, LLC.



FIGU	SITE PARAGEMENT PARA BILL AND	AT NICHOLS STREET) IT (2273 TIMBER RIDGE)	01 SOUTH UNION STREET)
RE 2	BOU SOUTH UNION STREET SITE SPENCERPORT, NEW YORK BCP SITE NO. C828153 PREPARED FOR	REPORTING LLC BULFFALLO, NJ RESTORATION, LLC (716) 856-0 10R NIO • 0188-013-001	r 14218 1635
DISCLAIMER PROPERTY DISCLOSED	EYEZON ASSOCIATES, INC. ^{2.} OF TURVKEY ENVIRONMENTAL RESTORATION, LLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJE 2. OF TURVKEY ENVIRONMENTAL RESTORATION, LLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJE 3. OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSEN:	OC NO. 0100-015-001 ST TO RECALL AT ANY TIME. INFORMATION CONTAINED HE OF TURNKEY ENVIRONMENTAL RESTORATION, LLC.	EREON IS NOT TO BE









80'

BE

5

NOT

S

- BROWNFIELD CLEANUP PROGRAM BOUNDARY

- SHALLOW OVERBURDEN MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- MONITORING WELL LOCATION (BY OTHERS)



ATE: SEPTEMBER 201



OCTOBER 21 ED BY: BLR



PROPERTY OF TURNKEY ENVIRONMENTAL RESTORATION, LLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF TURNKEY ENVIRONMENTAL RESTORATION, LLC.

APPENDIX A

EXCAVATION WORK PLAN



BROWNFIELD CLEANUP PROGRAM

APPENDIX A EXCAVATION PLAN

500 SOUTH UNION STREET SITE NYSDEC SITE NUMBER: C828153 SPENDERPORT, NEW YORK

November 2014

0188-013-001

Prepared for:

Eyezon Associates, Inc.



TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716)856-0635



SITE MANAGEMENT PLAN APPENDIX A: EXCAVATION PLAN 500 South Union Street Site

Table of Contents

A-1:	NOTIFICATION
A-2:	SOIL SCREENING METHODS 4
A-3:	STOCKPILE METHODS 4
A-4:	MATERIALS EXCAVATION AND LOAD OUT
A-5:	MATERIALS TRANSPORT OFF-SITE
A-6:	MATERIALS DISPOSAL OFF-SITE
A-7:	MATERIALS REUSE ON-SITE
A-8:	FLUIDS MANAGEMENT
A-9:	COVER SYSTEM RESTORATION
A-10:	BACKFILL FROM OFF-SITE SOURCES
A-11:	STORMWATER POLLUTION PREVENTION11
A-12:	CONTINGENCY PLAN
A-13:	COMMUNITY AIR MONITORING PLAN12
A-14:	Odor Control Plan14
A-15:	DUST CONTROL PLAN15
A-16:	OTHER NUISANCES16


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:

Charlotte Theobald Environmental Engineer I NYSDEC – Region 8 6274 E. Avon-Lima Road Avon, NY 14414-9519

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 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, in electronic format, if it differs from the HASP provided in Appendix C 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

Field based soil screening, including visual (e.g., staining), olfactory and instrumentbased (photoionization detector -PID) will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination) beneath the cover system. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed, such as excavations for foundations and utility work, after issuance of the COC. If field PID readings above 10 ppm are recorded, the excavated material will be segregated and staged, as described below.

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

Material that requires testing and/or off-site disposal will be placed on and covered with polyethylene sheeting to prevent infiltration of precipitation and wind erosion. If offsite disposal of the material is planned, the stockpiled impacted material will be characterized per the requirements of a permitted disposal facility. Stockpiled impacted material will not remain on-site for more than 90 days. Upon obtaining an approved waste profile, the impacted material will be transported and disposed of off-site. 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 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 NYSDEC.

A-4: MATERIALS EXCAVATION AND LOAD OUT

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 owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

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 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 NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. 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 OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded, in accordance with the material(s) being transported.

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 will be described in the excavation notification based on the disposal facility location.



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; (f) overall safety in transport; and, (g) community input (when necessary).

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 OFF-SITE

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 6NYCRR Part 360) and Federal regulations at a permitted disposal facility. 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. The NYSDEC project manager's approval must be obtained prior to the material being exported from the Site.

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 6NYCRR Part 360-1.2. Material that does not



meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

A-7: MATERIALS REUSE ON-SITE

'Reuse on-site' means reuse on-site of material that originates at the site and which does not leave the Site during the excavation. The criteria under which soil/fill originating on-Site may be used on-Site are presented below.

- Excavated, Non-Impacted On-Site Soil/Fill: Non-impacted soil/fill (i.e., soil/fill that does not exhibit visible or olfactory evidence of contamination, and is not grossly contaminated (as described in Part 375), and does not exhibit PID readings that exceed 10 parts per million (ppm) that is excavated from the Site may be used on-Site as backfill beneath the cover system without special handling. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-Site.
- Excavated, Potentially Impacted On-Site Soil/Fill: Potentially impacted soil/fill (i.e., soils that exhibit field visual and/or olfactory evidence of contamination, or with elevated PID readings (above 10 ppm) may not be used on-Site unless tested and determined to meet the chemical criteria for Commercial Use SCOs per 6NYCRR Part 375. Potentially impacted material will be segregated, as described above, and sampled to determine acceptance for reuse. The material reuse analyses will be discussed with the Department, and may include the following:
 - o USEPA's Target Compound List (TCL) Volatile Organic Compounds (VOCs), analyzed by USEPA SW846 Method 8260C;
 - o TCL Semivolatile Organic Compounds (TCL SVOCs, SW846 Method 8270B);
 - o TCL Pesticides (SW846 Method 8081);
 - o PCBs (SW846 Method 8082); and
 - o Target Analyte List (TAL) Metals (SW846 Methods 6010 or 7000-series).

The analytical results will be compared to NYSDEC's current Commercial Use SCOs. If concentrations are below Commercial Use SCOs (CSCOs), the soil can be reused on-Site. If the concentrations are elevated above CSCOs, the results shall be shared with the NYSDEC and approval obtained prior to their specified reuse on-Site. It should be noted



the NYSDEC may require highly-impacted materials to be transported off-Site and disposed of at a permitted landfill facility in accordance with all applicable local, state, and federal regulations. Staging and stockpiling management of materials should be conducted as described in the sections above.

Chemical criteria for on-site reuse of material have been approved by NYSDEC and are listed in Table 10 of the SMP. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site 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.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site 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 on-site.

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 off-site at a permitted facility.

If water is generated during future site activities and discharge is to surface waters (i.e. a local pond, stream or river), such will be performed under a SPDES permit. 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 SPDES 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 Decision Document. The demarcation layer, consisting of orange snow fencing material or equivalent material, will be replaced to provide a visual reference to the top of the remaining in-place material (Remaining Contamination Zone), the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP.. 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

The criteria under which off-site material may be used as backfill are presented below.

- Off-Site Soil/Fill: Off-Site soil/fill may be used as backfill provided that it originates from known sources having no evidence of disposal or releases of hazardous substances; hazardous, toxic or radioactive wastes; or petroleum, and is tested and meet all of the criteria shown on Table 10 of the SMP in accordance with Appendix 5 of DER-10. In addition, no off-Site materials meeting the definition of a solid waste as defined in 6 NYCRR, Part 360-1.2 (a) shall be used as backfill.
- Other Off-Site Material: Material other than soil may be imported as backfill, without chemical testing, provided it contains less than 10% (by weight) material that would pass through a size 80 sieve: 1) Rock or stone, consisting of virgin material from a permitted mine or quarry; 2) Recycled concrete, brick, or asphalt from a NYSDEC-registered or permitted C&D debris processing facility (as specified in Section 360-16.1 of 6 NYCRR Part 360) that conforms to Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002). As stated in Section 360-16.4(b)(2), the facility may only accept recognizable, uncontaminated, non-pulverized C&D debris or C&D debris from other authorized C&D processing facilities. According to Section 360-16.2(c), "uncontaminated" means C&D debris that is not mixed or commingled with other solid waste at the point of generation, processing, or disposal, and that is not contaminated with spills of a petroleum product, hazardous waste, or industrial waste.

Off-Site borrow soils shall be tested to assure conformance with the criteria identified above. If an off-Site soil/fill borrow source is of unknown origin or originates from a commercial or urban site, then a tiered approach based on the volume of impacted soil/fill being excavated will be used to determine the frequency of characterization sampling in accordance with DER-10, Section 5.4 and Table 5.4(3)10 (see below)



In addition to the above criteria, backfill materials being imported to the Site will be subject to the following characterization requirements in accordance with DER-10 Table 5.4(e)10:

Required Minimum Number of Soil Samples for Soil Imported to a Site			
Soil Organtity (CV)	VOCs	SVOCs, Inorganics & PCBs/Pesticides	
Son Quantity (C1)	Discrete Samples	Composite	Grab/Composite Samples
0-50	1	1	3-5 grab samples from
50-100	2	1	different locations in the fill
100-200	3	1	being provided will comprise
200-300	4	1	a composite sample for
300-400	4	2	analysis.
400-500	5	2	7
500-800	6	2	
800-1,000	7	2	
>1,000	Add an additional 2 VOC and 1 composite for each additional 1,000		
	CY or consult with DER		

Each composite sample will be comprised of a minimum of three grab samples (samples for VOC analysis will be collected as individual grabs in lieu of composites). Samples will be analyzed for the following constituents in accordance with USEPA SW-846 methodology:

- TCL VOCs Method 8260C
- TCL SVOCs Method 8270D
- TAL Metals Method 6010B
- TCL Organochlorine Pesticides and PCBs Method 8081A/8082

Characterization testing will be performed by an independent, NYSDOH ELAPapproved laboratory. An equivalent Category B deliverables package will be furnished with the data to allow data evaluation and preparation of a Data Usability Summary Report by an independent, third party data validation expert. Backfill analytical results will be documented in the PRR.

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.



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

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 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 10 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 wind and precipitation erosion/releases.

A-11: STORMWATER POLLUTION PREVENTION

If future site activities disturb more than one acre of land, 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 (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 also included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-13: COMMUNITY AIR MONITORING PLAN

The Community Air Monitoring Plan (CAMP) will follow the guidance provided in the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan found in Appendix 1A of NYSDEC's DER-10 *Technical Guidance for Site Investigation and Remediation.* The CAMP for this Site is included as Appendix C of this SMP. The CAMP will be implemented for all intrusive activities performed at the site. The upwind and downwind monitoring locations required in the generic CAMP will be determined based on the prevailing wind direction at the start of work. Air sampling locations will be adjusted on a daily or more frequent basis based on actual wind directions and work locations. VOC monitoring will be performed using a PID or other equipment that is capable of calculating 15-minute running average concentrations. All air monitoring equipment will be calibrated at least daily. The 15-minute average concentration will be compared to the levels specified below.

Alternatively, the upwind monitoring location may be removed, as long as the background contribution is considered to be 0.0 ppm.



ORGANIC VAPOR PERIMETER MONITORING:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
- All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

EXPLOSIVE VAPORS:

Explosive vapor community air monitoring will be performed at the downwind perimeter of the Site on a continuous basis whenever sustained atmospheric concentrations of greater than 10% of the LEL are recorded in the exclusion zone. If sustained atmospheric concentrations of greater than 10% LEL are recorded at the downwind Site perimeter, the local Fire Department will be contacted (see Section 2.5.1 of the SMP for phone number).

AIRBORNE PARTICULATE COMMUNITY AIR MONITORING

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the downwind perimeter of the exclusion zone. The monitoring will be performed using



real-time monitoring equipment capable of measuring less than 10 micrometers in size (PM-10) and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m³) greater than the background reading for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression provided that the downwind PM-10 particulate levels do not exceed 150 ug/m³ above the background level and that visible dust is not migrating from the work area.
- If, after implementation of dust suppression techniques downwind PM-10 levels are greater than 150 ug/m³ above the background level, work activities must be stopped and dust suppression controls re-evaluated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m³ of the background level and in preventing visible dust migration.

The location of air sampling stations will be based on generally prevailing wind conditions. These locations will be adjusted throughout the day based on actual wind directions to provide upwind (if used) and downwind monitoring stations. Upwind/background monitoring may be discontinued in the event of obtaining a sustained 0.0 ppm reading.

Exceedance of action levels listed in the CAMP 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 and on-site. Specific odor control methods may include: limiting exposed face of the excavation area, reduction in work hours and/or specific work activities (e.g. load out of material), proof rolling excavation, and application of odor control agents (e.g. spray-foam). 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 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.



- Covering or proof-rolling excavated areas and materials after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.

A-16: OTHER NUISANCES

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local ordinances, as necessary (e.g. rodent control, noise control).



APPENDIX B

ENVIRONMENTAL EASEMENT



State of New York



CHERYL DINOLFO

MONROE COUNTY CLERK'S OFFICE WARNING - THIS SHEET CONSTITUTES THE CLERKS ENDORSEMENT, REQUIRED BY SECTION 317-a(5) & SECTION 319 OF THE REAL PROPERTY LAW OF THE STATE OF NEW YORK. DO NOT DETACH OR REMOVE.

Ś

Total



.

95.00

Index DEEDS Page 117 Instrument EASEMENT AGREEMENT Date : 12/12/2014 Time : 02:27:01PM Control # 201412120520 TT0000007231 Ref 1 #

Receipt # 1172255

Employee : RebeccaZ

COUNTY FEE TP584	\$ 5.00
COUNTY FEE NUMBER PAGES	\$ 45.00
RECORDING FEE	\$ 45.00
STATE FEE TRANSFER TAX	\$ 0.00

MONROE COUNTY CLERK'S OFFICE

ROCHESTER, NY

TRANSFER AMT

TRANSFER AMT

\$1.00

: 1

LUURADED

OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW DEC 12 PH 2: 27

THIS INDENTURE made this <u>Jec</u> day of <u>Decomber</u>, 20<u>14</u> between Owner(s) Eyezon Associates, Inc., having an office at 2344 Lyell Avenue, Rochester, County of Monroe, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of 500 South Union Street in the Village of Spencerport, County of Monroe and State of New York, known and designated on the tax map of the County Clerk of Monroe as tax map parcel numbers: Section 087.17 Block 1 Lot 61, being the same as that property conveyed to Grantor by deed dated October 15, 1999 and recorded in the Monroe County Clerk's Office in Liber and Page 09228 0382. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.27 +/- acres, and is hereinafter more fully described in the Land Title Survey dated July 29, 2014 and revised July 31, 2014 and on the 10th, 17th, and 22nd day of September, 2014 prepared by Bileschi Land Surveying, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: B8-0790-08-09, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. <u>Purposes</u>. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. <u>Institutional and Engineering Controls</u>. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment_as determined by the NYSDOH or the Monroe County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining

Environmental Easement Page 2

contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Residential or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section Division of Environmental Remediation NYSDEC 625 Broadway Albany, New York 12233 Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require. submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1)the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

the institutional controls and/or engineering controls employed at such site: (i)

are in-place;

(2)

are unchanged from the previous certification, or that any identified (ii) changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment:

the owner will continue to allow access to such real property to evaluate the (3)continued maintenance of such controls:

nothing has occurred that would constitute a violation or failure to comply (4) with any site management plan for such controls;

the report and all attachments were prepared under the direction of, and (5 reviewed by, the party making the certification;

to the best of his/her knowledge and belief, the work and conclusions (6) described in this certification are in accordance with the requirements of the site remedial program. and generally accepted engineering practices; and

the information presented is accurate and complete. (7)

Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the 3. State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

Α. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement:

Β. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. <u>Notice</u>. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:	Site Number: C828153
	Office of General Counsel
	NYSDEC
	625 Broadway
	Albany New York 12233-5500

With a copy to:

Site Control Section Division of Environmental Remediation NYSDEC 625 Broadway Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and

Environmental Easement Page 5

communicating notices and responses to requests for approval.

7. <u>Recordation</u>. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. <u>Amendment</u>. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. <u>Extinguishment.</u> This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. <u>Joint Obligation</u>. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Eyezon Associates, Inc.: E Ciberra Print Name: Robert Spencer Title: (Ves

Grantor's Acknowledgment

STATE OF NEW YORK

COUNTY OF

On the <u>12</u>⁴⁴ day of <u>Aloumber</u>, in the year 20 <u>14</u>, before me, the undersigned, personally appeared <u>Lobert Spanon</u>, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of whigh the individual(s) acted, executed the instrument.

Notary Public - State of New York

ARTHUR L. JAMES IN NOTARY PUBLIC, State of New York No. 02JA6283388 Qualified in Monroe County Commission Expires June 3, 2017

)) ss:

)

Environmental Easement Page 7

County: Monroe Site No: C828153 Brownfield Cleanup Agreement Index : B8-0790-08-09

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: ____

Robert W. Schick, Director Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)) ss: COUNTY OF ALBANY)

On the 3^{cd} day of <u>econdek</u>, in the year 201^{4} , before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of whigh the individual acted, executed the instrument.

Notary Public of New York ate

David J. Chiusano Notary Public, State of New York No. 01CH5032146 Qualified in Schenectady Countyp Commission Expires August 22, 20

SCHEDULE "A" PROPERTY DESCRIPTION

ALL THAT TRACT OR PARCEL OF LAND situate in the Village of Spencerport, Town of Ogden, County of Monroe, State of New York, being located in part of town lot 57 and more particularly bounded and described as follows:

BEGINNING at point in the east line of South Union Street, which point is the northeast corner of property appropriated by the State of New York and described in a liber 1175 of Appropriation maps, page 162;

(1) thence going in an easterly direction, creating an interior angle of 91°12'11" in the southeast quadrant going a distance of 241.00' to a point being the northeast corner of this parcel herein being described;

(2) thence forming an interior angle of 90°00'00" and going a distance of 251.00' to a point being located on the north right of way line of Nichols Street as it now exists after the highway appropriation at liber 1175 of appropriation maps, page 162;

(3) thence forming an interior angle of 80°05'07" and going along the north right of way line of Nichols Street, as it now exists, for a distance of 52.00' to an angle point in said right of way line;

(4) thence forming an interior angle of 187°23'00" along said north right of way line, for a distance of 126.07' to the point of intersection with the east right of way line of South Union Street;

(5) thence forming an interior angle of 128°44'43" and going along the east right of way line of South Union Street a distance of 113.20' to an angle point in said east right of way line;

(6) thence forming an interior angle of 142°34'59" and going in a northerly direction, along said east right of way line, for a distance of 145.18' to the point and place of beginning.

The area of the above described subject parcel is now 55,301.87 square feet or 1.27 acres



going a distance of 241.00' to a point being the north east corner of this parcel herein being described. 2.)Thence forming an interior angle of 90'00'00" and going a distance of 251.00' to a point being located on the north right of way line of Nichols Street as it now exists after the highway appropriation at liber 1175 of appropriation maps, page 162. 3.) Thence forming an interior angle of 80'05'07" and going along the north right of way line of Nichols Street, as it now exists, for a distance of 52.00' to an angle point in said right of way line. 4.) Thence forming an interior angle of 187'23'00", along said north right of way line, for a distance of 126.07' to the point of intersection with the east right of way line of South Union Street. 5.) Thence forming an interior angle of 128 44 43" and going along the east right of way line of South Union Street a distance of 113.20' to an angle point in said east right of way line. 6.) thence forming an interior angle of 142 34 59" and going in a northerly direction , along said east right of way line, for a distance of 145.18' to the point and place of beginning. The area of the above described subject parcel is now 55,301.87 square feet or 1.27 acres.

THE ENGINEERING AND INSTITUTIONAL CONTROLS for the Easement set forth in more detail in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property . The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@gw.dec.state.ny.us."

ENVIRONMENTAL EASEMENT AREA ACCESS: THE DEC OR THEIR AGENT MAY ACCESS THE ENVIRONMENTAL EASEMENT AREA AS SHOWN HEREON THROUGH ANY EXISTING STREET ACCESS OR BUILDING INGRESS/EGRESS ACCESS POINT"

ENGINEERING/INSTITUTIONAL CONTROLS:

Site Management Plan (SMP) frequency and in a manner defined in the SMP.

monitoring must be preformed as defined in the SMP.

Vapor Intrusion- The existing one-story masonry building on the site is constructed with an Active Subslab Depressurization (ASD) System. The ASD System must be operated and maintained as specified in the SMP. The potential for vapor intrusion must be evaluated for any additional buildings developed onsite, and any potential impacts that are identified must be monitored or mitigated as specified in the SMP.

Vegetable gardens- and farming on the property are prohibited.

Cover System - Any future intrusive work that will penetrate the Cover System, or encounter or disturb the remaining contamination, including any modifications or repairs to the Cover Systems, must be preformed in compliance with the Excavation Work Plan (EWP) specified in the SMP

375-1.8(g)(2)(ii), (iii), & (iv).

SCHEDULE A: ENVIRONMENTAL EASEMENT AREA AND

ALL THAT TRACT OR PARCEL OF LAND situate in the Village of Spencerport, Town of Oaden. County of Monroe. State of New York, being located in part of town lot 57 and more particularly bounded and described as follow: Beginning at a point in the east line of South Union Street, which point is the northeast corner of property appropriated by the State of New York and described in a liber 1175 of Appropriation maps,

1.)Thence going in an easterly direction, creating an interior angle of 91"12'11", in the southeast quadrant,

All Engineering Controls must be operated and maintained as specified in the

All Engineering Controls on the Controlled Property must be inspected at a

Groundwater Monitoring and other environmental or public health

Groundwater Use Restrictions— The use of groundwater underlying the property is prohibited without treatment rendering it safe for the intended use.

Land Use- The use and development of the site is limited to Commercial and Industrial uses only as defined in 6 NYCRR Part

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New

AREA:

- 1.) AREA OF ORIGINAL DEED DESCRIPTION TO R.O.W. LINE=
- 60,172.13 SQ. FT. OR 1.381 ACRES. 2.) AREA OF PARCEL AFTER HIGHWAY APPROPRIATION AT REF. # 4, TO R.O.W. LINE = 55,301.87 SQ. FT. OR 1.270 ACRES.
- NOT TO SCALE SITE LOCATION: VILLAGE OF SPENCERPORT "Unauthorized alteration or addition to a survey map bearing a licensed land surveyors seal is a violation of section 7209 Subdivision 2, of the New York State Education Law." Only copies from the original of this survey marked with an original land surveyors seal shall be considered to be valid true copies." Certifications shall run only for the person for whom the survey is prepared, and on for whom the survey is prepared, and on behalf of the title company insuring the the fee, the governmental agency and lending institution listed hereon, and to the assignees of the lending institution. Certifications are not transferable to additional institutions or subsequent owners. This map is subject to any easements and/or encumbrances that an abstract of title may show. No guarantee is made that all easements pertinent to the subject to the subject property are shown on this map. subject property are shown on this map. The word "certify" or "certification" as shown and used hereon means an expression of professional opinion regarding the facts of the survey and does not constitute a warranty of guarantee expressed or implied. Location of subterranean improvements, easements, and utilities which are covered may be approximate or not even shown hereon. Landscaping features are not shown on this map unless otherwise specified. This plan does not extend any type of specified. This plan does not extend any type of cartification or guarantee, what so ever, to any engineering aspect shown page 1 or 2 of this plan NOTE: Property corners should only be set by a licensed, registered land surveyor. REVISIONS DATE DESCRIPTION 07/31/2014 D.E.C. REQUIR. ADDED 09/10/2014 D.E.C. REVISIONS 09/17/2014 REVISED TITLES 09/22/2014 REVISED TITLES 11/18/2014 REVISED LAND USE **CERTIFICATION:** I hereby certify to: N.Y.S. DEPT. OF ENVIRONMENTAL CONSERVATION; KNAUF SHAW LLP; EYEZON ASSOCIATES, INC.; that this map was made JULY 29, 2014 from notes of an Instrument SURVEY COMPLETED ON APRIL 25, 2013 , AND FROM REFERENCE LISTED HEREON. JAMES M. LEONI, N.Y.S.L.S. # 49225 TAX ACCOUNT NO .: 087.170-01-061 INSTRUMENT SURVEY MAP <u>SHOWING</u> SITE MANAGEMENT PLAN 500 SOUTH UNION STREET BEING PART OF TOWN LOT 57, SITUATE IN THE VILLAGE OF SPENCERPORT, COUNTY OF MONROE, STATE OF NEW YORK BILESCHI LAND SURVEYING 435 REYNOLDS ARCADE ROCHESTER, NEW YORK 14614 (716) 454-6010 (phone) (716) 454-6015 (fax) JAMES M. LEONI, LS OF CONSULT JULY 29, 2014

₩-\$\$\$-1

N.Y.S. RT.

^{FILE No.} 140152JL

OWNER: EYEZON ASSOCIATES INC SCALE: 1' = 20'

APPENDIX C

HEALTH & SAFETY PLAN (HASP) & Community Air Monitoring Plan (CAMP)



SITE MANAGEMENT PLAN APPENDIX C

HEALTH AND SAFETY PLAN

500 SOUTH UNION STREET SITE SPENCERPORT, NEW YORK

December 2014

0188-013-001

Prepared for:

Eyezon Associates, Inc.

Prepared by:



ACKNOWLEDGEMENT

Plan Reviewed by (initial):

Corporate Health and Safety Director:	Thomas Forbes	
Project Manager:	Michael Lesakowski	
Designated Site Safety and Health Officer:	Bryan Hann	

Acknowledgement:

I acknowledge that I have reviewed the information contained in this site-specific Health and Safety Plan, and understand the hazards associated with performance of the field activities described herein. I agree to comply with the requirements of this plan.

NAME (PRINT)	SIGNATURE	DATE



TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	General	1
1.2	Background	1
1.3	Previous Investigations	2
1.3	3.1 November 1998– Phase I/II Environmental Site Assessment	2
1.3	3.2 March 2008 – Phase I ESA and Limited Phase II Site Investigation	2
1.3	3.3 June 2008 – Additional Subsurface Investigation	3
1.3	3.4 April-June 2010 – RI/AAR Work Plan	3
1.3	3.5 August-September 2010 – ASD System IRM Work Plan and Vapor Sampling	3
1.3	3.6 November 2012 – RI/AAR	4
1.3	3.7 March - April 2014- Remedial Action Work Plan	6
1.4	Parameters of Interest	6
1.5	Overview of RA Activities	6
2.0	ORGANIZATIONAL STRUCTURE	7
2.1	Roles and Responsibilities	7
2.1	1.1 Corporate Health and Safety Director	7
2.1	1.2 Project Manager	7
2.1	1.3 Site Safety and Health Officer	8
2.1	1.4 Site Workers	9
2.1	1.5 Other Site Personnel	9
3.0	HAZARD EVALUATION	
3.1	Chemical Hazards	
3.2	Physical Hazards	11
3.2	2.1 Earthmoving Equipment	12
3.2	2.2 Excavation	13
3.2	2.3 Exposure to Public Vehicular Traffic	13
3.3	In-Situ Injection Reagent	15
4.0	TRAINING	16
4.1	Site Workers	16
4.1	1.1 Initial and Refresher Training	16
4.1	1.2 Site Training	17
4.2	Supervisor Training	
4.3	Emergency Response Training	
4.4	Site Visitors	



TABLE OF CONTENTS

5.0 MEDICAL MONITORING	20
6.0 SAFE WORK PRACTICES	22
7.0 PERSONAL PROTECTIVE EQUIPMENT	24
7.1 Equipment Selection	
7.2 Protection Ensembles	
7.2.1 Level A/B Protection Ensemble	
7.2.2 Level C Protection Ensemble	
7.2.3 Level D Protection Ensemble	
7.2.4 Recommended Level of Protection for Site Tasks	
8.0 EXPOSURE MONITORING	
8.1 General	
8.1.1 On-Site Work Zone Monitoring	
8.1.2 Off-Site Community Air Monitoring	
8.2 Monitoring Action Levels	
8.2.1 On-Site Work Zone Action Levels	
8.2.2 Community Air Monitoring Action Levels	
9.0 SPILL RELEASE/RESPONSE	
9.1 Potential Spills and Available Controls	
9.2 Initial Spill Notification and Evaluation	
9.3 Spill Response	
9.4 Post-Spill Evaluation	
10.0 HEAT/COLD STRESS MONITORING	
10.1 Heat Stress Monitoring	39
10.2 Cold Stress Monitoring	41
11.0 WORK ZONES AND SITE CONTROL	43
12.0 DECONTAMINATION	45
12.1 Decontamination for TurnKey-Benchmark Employees	45
12.2 Decontamination for Medical Emergencies	
12.3 Decontamination of Field Equipment	
13.0 CONFINED SPACE ENTRY	47



TABLE OF CONTENTS

14.0 FIRE PREVENTION AND PROTECTION	
14.1 General Approach	
14.2 Equipment and Requirements	
14.3 Flammable and Combustible Substances	
14.4 Hot Work	49
15.0 EMERGENCY INFORMATION	49
16.0 REFERENCES	50

LIST OF TABLES

Table 1	Constituents of Potential Concern & Observed Concentrations by Media
Table 2	Toxicity Data for Constituents of Concern
Table 3	Potential Routes of Exposure to Constituents of Concern
Table 4	Required Levels of Personnel Protection

LIST OF FIGURES

Figure 1	Site Vicinity and Location Map
Figure 2	Site Plan

APPENDICES

- Appendix A-1 Emergency Response Plan
- Appendix A-2 NYSDOH Generic Community Air Monitoring Plan
- Appendix A-3 Hot Work Permit Form
- Appendix A-4 Regenesis 3-D MicroEmulsion®



1.0 INTRODUCTION

1.1 General

In accordance with Occupational Safety and Health Administration (OSHA) requirements contained in 29 CFR 1910.120, this Health and Safety Plan (HASP) describes the specific health and safety practices and procedures to be employed by TurnKey Environmental Restoration, LLC and Benchmark Environmental Engineering & Science, PLLC employees (referred to jointly hereafter as "TurnKey-Benchmark") during the remaining Brownfield Cleanup Program (BCP) activities at the 500 South Union Street Site located in the Village of Spencerport, New York (see Figure 1). This HASP presents procedures for TurnKey-Benchmark employees who will be involved with field activities; it does not cover the activities of other contractors, subcontractors or other individuals on the Site. These firms will be required to develop and enforce their own HASPs as discussed in Section 2.0 of this HASP. TurnKey-Benchmark accepts no responsibility for the health and safety of contractor, subcontractor or other personnel.

This HASP presents information on known Site health and safety hazards using available historical information, and identifies the equipment, materials and procedures that will be used to eliminate or control these hazards. Environmental monitoring will be performed during the course of field activities to provide real-time data for on-going assessment of potential hazards.

All TurnKey personnel involved with the field activities associated with the Site will be required to comply with this HASP and any field modifications as directed by the Site Safety and Health Officer.

1.2 Background

The subject property (hereinafter, the "Project Site" or the "Site") is an approximate 1.2-acre parcel of land developed with a multi-tenant commercial building, including a drycleaner, restaurant, pizzeria, salon and deli, located in the Village of Spencerport, New York. The Site is bounded by South Union Street to the west, Nichols Street to the south, residential condominiums/apartments to the north, and a residential/commercial apartment building to the east (see Figure 2).



The Site has included a dry cleaning operation since the early 1970s. The dry cleaner utilized tetrachloroethene, PCE, a common dry cleaning solvent, in their process prior to 2000. Previous investigations identified the presence of chlorinated volatile organic compound (VOC)-impacted soil and groundwater on-site, suspected to be the result of prior housekeeping practices at the Site by the dry cleaner operators/owners. Additional information relative to the previous work completed at the Site is provided below.

Eyezon Associates, Inc., has elected to pursue cleanup of the 500 South Union Street Site under the New York State Brownfield Cleanup Program (BCP or Program) administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with Brownfield Cleanup Agreement No. B8-0790-08-09, which was executed on August 27, 2009.

1.3 Previous Investigations

1.3.1 November 1998– Phase I/II Environmental Site Assessment

Haley & Aldrich (H&A) completed a Focused Phase I/II Environmental Site Assessment in November 1998. The Phase I ESA findings identified historic use of the Site as a dry-cleaner since the 1970s and evidence of historic exterior disposal/storage of dry-cleaning machine filters in dumpsters sited east of the building. The Phase II study identified elevated concentrations of chlorinated (cVOCs), specifically tetrachloroethene (PCE) and trichloroethene (TCE), which are typically associated with dry cleaning operations within groundwater at each of the monitoring well locations. Soil samples exhibited elevated concentrations of cVOCs and were also slightly impacted by petroleum VOCs (pVOCs) at lower concentrations.

1.3.2 March 2008 – Phase I ESA and Limited Phase II Site Investigation

TurnKey performed a Phase I ESA and a Phase II Site Investigation at the Site in March 2008. The Phase I ESA conclusions were generally consistent with the November 1998 H&A ESA. The Phase II investigation results indicated the presence cVOC analytes attributable to past dry-cleaning operations (i.e., PCE and its chemical breakdown products) in on-site soil and groundwater concentrations that exceeded the Unrestricted Use and Groundwater Protection SCOs, and GWQS, respectively.



1.3.3 June 2008 – Additional Subsurface Investigation

TurnKey conducted an Additional Subsurface Investigation at the Site in June 2008. This investigation was performed to further assess upgradient and downgradient groundwater quality following the identification of chlorinated-impacts to site groundwater during previous investigations.

1.3.4 April-June 2010 – RI/AAR Work Plan

In April 2010, TurnKey completed an Remedial Investigation/Alternatives Analysis Report (RI/AAR Work Plan) to present the proposed scope of work and implementation procedures at the Site. The proposed work included collection of additional soil/fill, groundwater and vapor samples.

The work plan was approved by the New York State Department of Environmental Conservation (NYSDEC) in June 2010.

1.3.5 August-September 2010 – ASD System IRM Work Plan and Vapor Sampling

An Active Subslab Depressurization (ASD) System Interim Remedial Measures (IRM) Work Plan was prepared by TurnKey and submitted to the NYSDEC for review and approval in August 2010. The ASD IRM Work Plan details the system design and installation, post-installation confirmation testing procedures, and the system operation, maintenance and monitoring.

In September 2010, eight soil vapor samples including a background ambient and QA/QC Blind Duplicate, were collected and analyzed to determine the presence of cVOC vapors on the Site. The subsurface soil vapor sampling points, identified as SV-1 through SV-8, were located around the Site perimeter and, when possible, in close proximity to known or suspected utility trenches. Following sample collection, the Summa canisters were shipped to an New York State Department of Health (NYSDOH) -approved laboratory for analysis of United States Environmental Protection Agency (USEPA) Target Compound List (TCL) VOCs in accordance with USEPA Method TO-15. Individual VOC concentrations ranged from non-detect (ND) (several locations) to 980 ug/m³ (SV-7). PCE was detected at soil vapor locations SV-1, SV-2, and SV-3, all along the northern and northeastern portion of the Site. Among the daughter products: TCE, cis-1,2-DCE, and VC



were detected at soil vapor location SV-3; cis-1,2-DCE was also detected at location SV-6 on the southwestern portion of the Site.

1.3.6 November 2012 – RI/AAR

The purpose of the environmental investigation was to more fully define the nature and extent of contamination on the BCP Site, and to collect data of sufficient quantity and quality to perform the remedial alternatives evaluation. The field investigations were completed across the BCP Site to delineate areas requiring remediation. Below is a summary of site conditions when the RI was completed.

1.3.6.1 Soil/Fill

Based on surface soil sampling results, no exceedance of Commercial Use Soil Cleanup Objectives (SCOs) was detected for VOCs, metals, PCBs, pesticides and herbicides. One SVOC, benzo(a)pyrene was detected above its Commercial Use SCO (1.5 mg/kg vs. 1.0 mg/kg CSCO), but well below the Protection of Groundwater SCO (22 mg/kg) at surface soil sample locations SS-1 and SS-3. Lead and zinc were detected at concentrations slightly above their Unrestricted Use SCOs. The concentrations of 4,4'-DDE and 4,4'-DDT detected in SS-3 were slightly above their respective Unrestricted Use SCOs.

Based on subsurface soil data, no exceedance of Commercial Use SCOs was detected for VOC, semi volatile organic compounds (SVOCs), metals, poly-chlorinated biphenyls (PCBs), pesticides and herbicides. Four historic samples exceeded the Protection of Groundwater SCOs for one or more compounds; however, the concentrations were within one order of magnitude of the SCOs. PCE was the only compound detected above its Protection of Groundwater SCO with the highest concentration of PCE (14.67 mg/kg) was detected in a saturated soil sample B101 (8-10 fbgs) collected during a 1998 investigation.

1.3.6.2 Groundwater

Groundwater samples were collected from piezometers and monitoring wells completed in the shallow and deep saturated overburden deposits beneath the Site. Groundwater samples were collected from seven monitoring wells and eight piezometers that comprised the existing Site monitoring well network


Based on RI and historical data, SVOCs and inorganic compounds in groundwater are not considered to be of concern at the Site. Laboratory analytical results indicate that the groundwater is impacted by cVOCs. PCE and breakdown products TCE, cis-1,2-DCE, and VC were determined to be the principal contaminants of concern (COCs) as they were consistently detected at concentrations above the GWQS of 5 ug/L. Detected concentrations ranged from non-detect (ND) (PZ-3) to a maximum 4,000 ug/L (PZ-5). Of the 14 locations sampled, PCE was detected at 11 locations at a concentration greater than the GWQS of 5 ug/L. Daughter products of PCE, including TCE and cis-1,2-DCE, were also observed in shallow and deep groundwater at concentrations above their respective GWQSs. VC, another daughter product of PCE, was present at concentrations exceeding its GWQS in three shallow groundwater locations (PZ-3, PZ-6, and MW-3) and only detected at one deep groundwater location (MW-2D) at a concentration well below its GWQS/GV.

1.3.6.3 Soil Vapor

Several VOCs were detected in the ambient outdoor air sample as well as each of the eight perimeter subsurface soil vapor samples designated as Ambient and SV-1 through SV-8, respectively. Individual VOC concentrations ranged from non-detect (ND) (several locations) to 980 ug/m³ (SV-7). PCE was detected at soil vapor locations SV-1, SV-2, and SV-3, all along the northern and northeastern portion of the Site. Among the daughter products: TCE, cis-1,2-DCE, and VC were detected at soil vapor location SV-3; cis-1,2-DCE was also detected at location SV-6 on the southwestern portion of the Site.

1.3.6.4 Alternatives Analysis

Based on the RAA evaluation, TurnKey recommended the following:

- Groundwater treatment via enhanced in-situ reductive dechlorination of cVOCs in groundwater;
- Requirement for an ASD system to be installed as an engineering control within current and future buildings on the Site (planned for fall 2012 installation); and,
- Implementation of a Site Management Plan (SMP) that includes an IC/EC Plan, Operation and Maintenance Plan, Excavation Work Plan, Site Monitoring Plan and an Environmental Easement.



1.3.7 March - April 2014- Remedial Action Work Plan

TurnKey, in association with Benchmark Environmental Engineering and Science, PLLC (Benchmark), completed a Remedial Action Work Plan that was approved by the NYSDEC. Additional information relative to the RA activities completed at the Site is provided below.

1.4 Parameters of Interest

Based on the previous investigations, constituents of concern (COCs) in soil and groundwater at the Site are cVOCs and PAHs.

1.5 Overview of RA Activities

The following is a summary of the Remedial Actions performed and to be performed at the Site:

- Installation of ASD system) within the existing building, in accordance with the approved ASD IRM Work Plan. The ASD system includes 18 extraction/suction points manifolded to four (4) independent extraction fans.
- Injection program was completed in June 2014, in accordance with the Remedial Action Work Plan (March 2014). The in-situ enhanced biodegradation treatment included the direct injection of approximately 21,000 lbs. of Regenesis 3DME at 71 injection points located across the Site.
- Limited Excavation of soil/fill exceeding Commercial Use SCOs along the northern, southern and eastern property boundaries. Remedial excavation was completed in August and September 2014.
- Construction and maintenance of a composite cover system, including areas of the Site covered by the existing building, concrete sidewalk; asphalt parking and driveways; gravel and vegetated soil cover areas. Location and cover system type and related detail are shown on Figure 7 of the SMP. Areas of the Site not covered by buildings and/or impermeable cover (i.e., concrete and asphalt), are covered by a minimum 12-inch of approved backfill and/or topsoil. Pre- and post-elevation data is shown on Figure 7 of the SMP.
- Execution and recording of an Environmental Easement to restrict land use to commercial/industrial operations and prevent future exposure to any contamination remaining at the site.
- Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

Remedial activities were completed in November 2014.





2.0 ORGANIZATIONAL STRUCTURE

This section of the HASP describes the lines of authority, responsibility, and communication as they pertain to health and safety functions at the Site. The purpose of this section is to identify the personnel who impact the development and implementation of the HASP and to describe their roles and responsibilities. This section also identifies other contractors and subcontractors involved in work operations, and establishes the lines of communications among them for health and safety matters. The organizational structure described in this section is consistent with the requirements of 29 CFR 1910.120(b)(2). This section will be reviewed by the Project Manager and updated as necessary to reflect the current organizational structure at this Site.

2.1 Roles and Responsibilities

All TurnKey-Benchmark personnel on the Site must comply with the minimum 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.

2.1.1 Corporate Health and Safety Director

The TurnKey-Benchmark Corporate Health and Safety Director is *Mr. Thomas H. Forbes.* The Corporate Health and Safety Director is responsible for developing and implementing the Health and Safety program and policies for Benchmark-TurnKey and consulting with corporate management to ensure adequate resources are available to properly implement these programs and policies. The Corporate Health and Safety Director coordinates TurnKey-Benchmark's Health and Safety training and medical monitoring programs and assists project management and field staff in developing site-specific health and safety plans.

2.1.2 Project Manager

The Project Manager for this Site is *Mr. Michael Lesakowski*. The Project Manager has the responsibility and authority to direct all TurnKey-Benchmark work operations at the Site. The Project Manager coordinates safety and health functions with the Site Safety and Health Officer, and bears ultimate responsibility for proper implementation



of this HASP. He may delegate authority to expedite and facilitate any application of the program, including modifications to the overall project approach as necessary to circumvent unsafe work conditions. Specific duties of the Project Manager include:

- Preparing and coordinating the Work Plan for the Site.
- Providing TurnKey-Benchmark workers with work assignments and overseeing their performance.
- Coordinating health and safety efforts with the Site Safety and Health Officer (SSHO).
- Reviewing the emergency response coordination plan to assure its effectiveness.
- Serving as the primary liaison with Site contractors and the property owner.

2.1.3 Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) for this Site is *Mr. Bryan Hann*. The qualified alternate SSHO is *Mr. Richard L. Dubisz*. The SSHO reports to the Project Manager. The SSHO 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 SSHO are:

- Managing the safety and health functions for TurnKey-Benchmark personnel on the Site.
- Serving as the point of contact for safety and health matters.
- Ensuring that TurnKey-Benchmark field personnel working on the Site have received proper training (per 29 CFR Part 1910.120(e)), that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134), and that they are properly trained in the selection, use and maintenance of personal protective equipment, including qualitative respirator fit testing.
- Performing or overseeing Site monitoring as required by the HASP.
- Assisting in the preparation and review of the HASP.
- Maintaining site-specific safety and health records as described in this HASP.
- Coordinating with the Project Manager, Site Workers, and Contractor's SSHO as necessary for safety and health efforts.

2.1.4 Site Workers

Site workers are responsible for: complying with this HASP or a more stringent HASP, if appropriate (i.e., Contractor and Subcontractor's HASP); using proper PPE; reporting unsafe acts and conditions to the SSHO; and following the safety and health instructions of the Project Manager and SSHO.

2.1.5 Other Site Personnel

Other Site personnel who will have health and safety responsibilities will include the Drilling Contractor, who will be responsible for developing, implementing, and enforcing a Health and Safety Plan equally stringent or more stringent than TurnKey-Benchmark's HASP. TurnKey-Benchmark assumes no responsibility for the health and safety of anyone outside its direct employ. Each Contractor's HASP shall cover all non-TurnKey/Benchmark Site personnel. Each Contractor shall assign a SSHO who will coordinate with TurnKey-Benchmark's SSHO as necessary to ensure effective lines of communication and consistency between contingency plans.

In addition to TurnKey-Benchmark and Contractor personnel, other individuals who may have responsibilities in the work zone include subcontractors and governmental agencies performing Site inspection work (i.e., NYSDEC). The Contractor shall be responsible for ensuring that these individuals have received OSHA-required training (29 CFR 1910.120(e)), including initial, refresher and site-specific training, and shall be responsible for the safety and health of these individuals while they are on-site.



3.0 HAZARD EVALUATION

Due to the presence of certain contaminants at the Site, the possibility exists that workers will be exposed to hazardous substances during subgrade activities beneath the cover system. The principal routes of exposure would be direct contact with and incidental ingestion of soil, and through the inhalation of contaminated particles or vapors. Other points of exposure may include direct contact with groundwater. In addition, the use of drilling and/or medium to large-sized construction equipment (e.g., excavator) will also present conditions for potential physical injury to workers. Further, since work will be performed outdoors, the potential exists for heat/cold stress to impact workers, especially those wearing protective equipment and clothing. Adherence to the medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, establishment work zones and Site control, appropriate decontamination procedures and contingency planning outlined herein will reduce the potential for chemical exposures and physical injuries.

3.1 Chemical Hazards

Table 1 identifies known constituents of potential concern (COPCs) and ranges of concentrations, by media, observed during previous investigations. Based on this work, the COPCs include specific cVOCs and, to a lesser extent, petroleum VOCs. Table 2 lists toxicity and exposure data for these constituents of potential concern. Brief descriptions of the toxicology of these materials and related health and safety guidance and criteria are provided below.

- **Tetrachloroethene (PCE)** was widely used in dry cleaning operations as a solvent. It is harmful by ingestion inhalation and skin absorption. Exposure can cause dermatitis, dizziness, nausea, liver and kidney damage. This compound is a suspected carcinogen.
- Trichloroethene (TCE) was widely used in dry cleaning operations. It is toxic by inhalation and skin absorption. It is an irritant to the skin, eyes and mucous membranes. Symptoms of exposure may include headache, dizziness and nausea. Exposure may cause liver and kidney damage. TCE is a suspected human carcinogen.
- **cis-1,2-Dichloroethene (cis-1,2-DCE)** is a breakdown product of PCE. Direct exposure is mostly by inhalation resulting in heart and liver damage.

0188-013-001

- Vinyl Chloride is an intermediate in the production of chlorinated compounds. It is a biodegradation product of TCE and PCE. Inhalation exposure may result in damage to the liver, kidneys, lungs and other organs. In addition to liver cancer, exposure has also been linked to an increased risk of lung, brain, hematopoietic, and digestive tract cancers.
- Polycyclic Aromatic Hydrocarbons (PAHs) are formed as a result of the pyrolysis and incomplete combustion of organic matter such as fossil fuel. PAH aerosols formed during the combustion process disperse throughout the atmosphere, resulting in the deposition of PAH condensate in soil, water and on vegetation. In addition, several products formed from petroleum processing operations (e.g., roofing materials and asphalt) also contain elevated levels of PAHs. Hence, these compounds are widely dispersed in the environment. PAHs are characterized by a molecular structure containing three or more fused, unsaturated carbon rings. Seven of the PAHs are classified by USEPA as probable human carcinogens (USEPA Class B2). These are: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The primary route of exposure to PAHs is through incidental ingestion and inhalation of contaminated particulates. PAHs are characterized by an organic odor, and exist as oily liquids in pure form. Acute exposure symptoms may include acnetype blemishes in areas of the skin exposed to sunlight.

With respect to the RA activities discussed in Section 1.5, possible routes of exposure to the above-mentioned contaminants are presented in Table 3. The use of proper respiratory equipment, as outlined in Section 7.0 of this HASP, will minimize the potential for exposure to airborne contamination. Exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 7.0), safe work practices (Section 6.0), and proper decontamination procedures (Section 12.0).

3.2 Physical Hazards

Site Management field activities may present the following physical hazards:

- The potential for physical injury during heavy construction equipment use, such as backhoes, excavators and drilling equipment.
- The potential for heat/cold stress to employees during the summer/winter months (see Section 10.0).



• The potential for slip and fall injuries due to rough, uneven terrain and/or open excavations.

These hazards represent only some of the possible means of injury that may be present during Site Management activities at the Site. Since it is impossible to list all potential sources of injury, it shall be the responsibility of each individual to exercise proper care and caution during all phases of the work.

3.2.1 Earthmoving Equipment

- Only authorized personnel are permitted to operate earthmoving equipment.
- Maintain safe distance from operating equipment and stay alert of equipment movement. Avoid positioning between fixed objects and operating equipment and equipment pinch points, remain outside of the equipment swing and turning radius. Pay attention to backup alarms, but not rely on them for protection. Never turn your back on operating equipment.
- Approach operating equipment only after receiving the operator's attention. The operator shall acknowledge your presence and stop movement of the equipment. Caution shall be used when standing next to idle equipment; when equipment is placed in gear it can lurch forward or backward. Never approach operating equipment from the side or rear where the operator's vision is compromised.
- When required to work in proximity to operating equipment, wear high-visibility vests to increase visibility to equipment operators. For work performed after daylight hours, vests shall be made of reflective material or include a reflective stripe or panel.
- Do not ride on earthmoving equipment unless it is specifically designed to accommodate passengers. Only ride in seats that are provided for transportation and that are equipped with seat belts.
- Stay as clear as possible of all hoisting operations. Loads shall not be hoisted overhead of personnel.
- Earthmoving equipment shall not be used to lift or lower personnel.



• If equipment becomes electrically energized, personnel shall be instructed not to touch any part of the equipment or attempt to touch any person who may be in contact with the electrical current. The utility company or appropriate party shall be contacted to have line de-energized prior to approaching the equipment.

3.2.2 Excavation

- Do not enter the excavations unless completely necessary, and only after the competent person has completed the daily inspection and has authorized entry.
- Follow all excavation entry requirements established by the competent person.
- Do not enter excavations where protective systems are damaged or unstable.
- Do not enter excavations where objects or structures above the work location may become unstable and fall into the excavation.
- Do not enter excavations with the potential for a hazardous atmosphere until the air has been tested and found to be at safe levels.
- Do not enter excavations with accumulated water unless precautions have been taken to prevent excavation cave-in.

3.2.3 Exposure to Public Vehicular Traffic

The following precautions must be taken when working around traffic, and in or near an area where traffic controls have been established by a contractor.

- Exercise caution when exiting traveled way or parking along street avoid sudden stops, use flashers, etc.
- Park in a manner that will allow for safe exit from vehicle, and where practicable, park vehicle so that it can serve as a barrier.
- All staff working adjacent to traveled way or within work area must wear reflective/high-visibility safety vests.
- Eye protection should be worn to protect from flying debris.

- Remain aware of factors that influence traffic related hazards and required controls sun glare, rain, wind, flash flooding, limited sight-distance, hills, curves, guardrails, width of shoulder (i.e., breakdown lane), etc.
- Always remain aware of an escape route -- behind an established barrier, parked vehicle, guardrail, etc.
- Always pay attention to moving traffic never assume drivers are looking out for you.
- Work as far from traveled way as possible to avoid creating confusion for drivers.
- When workers must face away from traffic, a "buddy system" should be used, where one worker is looking towards traffic.
- Review traffic control devices to ensure that they are adequate to protect your work area. Traffic control devices should: 1) convey a clear meaning, 2) command respect of road users, and 3) give adequate time for proper traffic response. The adequacy of these devices are dependent on limited sight distance, proximity to ramps or intersections, restrictive width, duration of job, and traffic volume, speed, and proximity.
- Either a barrier or shadow vehicle should be positioned a considerable distance ahead of the work area. The vehicle should be equipped with a flashing arrow sign and truck-mounted crash cushion. All vehicles within 40 feet of traffic should have an orange flashing hazard light atop the vehicle.
- Except on highways, flaggers should be used when 1) two-way traffic is reduced to using one common lane, 2) driver visibility is impaired or limited, 3) project vehicles enter or exit traffic in an unexpected manner, or 4) the use of a flagger enhances established traffic warning systems.
- Lookouts should be used when physical barriers are not available or practical. The lookout continually watches approaching traffic for signs of erratic driver behavior and warns workers. Vehicles should be parked at least 40 feet away from the work zone and traffic. Minimize the amount of time that you will have your back to oncoming traffic.



3.3 In-Situ Injection Reagent

The in-situ injection reagent used in during remedial activities at the Site was Regenesis 3-D MicroEmulsion® (3DMe). The 3DMe is a liquid material with an appearance and viscosity roughly equivalent to milk. Although the 3DMe is nontoxic, field personnel should take precautions while handling and applying the material. Field personnel should use appropriate PPE (Level D) including eye protection. Gloves should be used as appropriate based on the exposure duration and field conditions. Product information and a Material Safety Data Sheet (MSDS) are provided in Appendix A-4 of this HASP.



4.0 TRAINING

4.1 Site Workers

All personnel performing Site Management activities at the Site (such as, but not limited to, equipment operators, general laborers, and drillers) who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors/managers responsible for the Site shall receive training in accordance with 29 CFR 1910.120(e) before they are permitted to engage in operations in the exclusion zone or contaminant reduction zone. This training includes an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Additional site-specific training shall also be provided by the SSHO prior to the start of field activities. A description of topics to be covered by this training is provided below.

4.1.1 Initial and Refresher Training

Initial and refresher training is conducted by a qualified instructor as specified under OSHA 29 CFR 1910.120(e)(5), and is specifically designed to meet the requirements of OSHA 29 CFR 1910.120(e)(3) and 1910.120(e)(8). The training covers, as a minimum, the following topics:

- OSHA HAZWOPER regulations.
- Site safety and hazard recognition, including chemical and physical hazards.
- Medical monitoring requirements.
- Air monitoring, permissible exposure limits, and respiratory protection level classifications.
- Appropriate use of personal protective equipment (PPE), including chemical compatibility and respiratory equipment selection and use.
- Work practices to minimize risk.
- Work zones and Site control.
- Safe use of engineering controls and equipment.
- Decontamination procedures.

16



- Emergency response and escape.
- Confined space entry procedures.
- Heat and cold stress monitoring.
- Elements of a Health and Safety Plan.
- Spill containment.

Initial training also incorporates workshops for PPE and respiratory equipment use (Levels A, B and C), and respirator fit testing. Records and certification received from the course instructor documenting each employee's successful completion of the training identified above are maintained on file at TurnKey-Benchmark's Buffalo, NY office. Contractors and Subcontractors are required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not been certified as having received health and safety training in conformance with 29 CFR 1910.120(e) is prohibited from working in the exclusion and contamination reduction zones, or to engage in any on-site work activities that may involve exposure to hazardous substances or wastes.

4.1.2 Site Training

Site workers are given a copy of the HASP and provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with the HASP and the information and requirements it contains. The Site briefing shall be provided by the SSHO prior to initiating field activities and shall include:

- Names of personnel and alternates responsible for Site safety and health.
- Safety, health and other hazards present on the Site.
- The site lay-out including work zones and places of refuge.
- The emergency communications system and emergency evacuation procedures.
- Use of PPE.
- Work practices by which the employee can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Medical monitoring is provided in Section 5 of this HASP and recognition of symptoms and signs of over-exposure as described in Section 10 of this HASP.



- Decontamination procedures as detailed in Section 12 of this HASP.
- The emergency response plan as detailed in Appendix A-1 of this HASP.
- Confined space entry procedures, if required, as detailed in Section 13 of this HASP.
- The spill release/response program as detailed in Section 9 of this HASP.
- Work zones and site control as detailed in Section 11 of this HASP.

Supplemental health and safety briefings will also be conducted by the SSHO on an as-needed basis during the course of the work. Supplemental briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing Site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include, but are not limited to: a change in Site conditions (e.g., based on monitoring results); changes in the work schedule/plan; newly discovered hazards; and safety incidents occurring during Site work.

4.2 Supervisor Training

On-site safety and health personnel who are directly responsible for or who supervise the safety and health of workers engaged in hazardous waste operations (i.e., SSHO) shall receive, in addition to the appropriate level of worker training described in Section 4.1.2, above, 8 additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

4.3 Emergency Response Training

Emergency response training is addressed in Appendix A-1 of this HASP, Emergency Response Plan.

4.4 Site Visitors

Each Contractor's SSHO will provide a site-specific briefing to all Site visitors and other non-TurnKey/Benchmark personnel who enter the Site beyond the Site entry point. The site-specific briefing will provide information about Site hazards, the Site layout including work zones and places of refuge, the emergency communications system and



emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Site visitors will not be permitted to enter the exclusion zone or contaminant reduction zones unless they have received the level of training required for Site workers as described in Section 4.1.



5.0 MEDICAL MONITORING

Medical monitoring examinations are provided to TurnKey-Benchmark employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment, annual and employment termination physicals for all TurnKey-Benchmark employees involved in hazardous waste site field operations. Post-exposure examinations are also provided for employees who may have been injured, received a health impairment, or developed signs or symptoms of over-exposure to hazardous substances or were accidentally exposed to substances at concentrations above the permissible exposure limits without necessary personal protective equipment. Such exams are performed as soon as possible following development of symptoms or the known exposure event.

Medical evaluations are performed by ADP Screening & Selection Services, an occupational health care provider under contract with TurnKey-Benchmark. ADP's local facility is Health Works WNY, Seneca Square Plaza, 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050 to schedule routine appointments or post-exposure examinations.

Medical evaluations are conducted according to the TurnKey-Benchmark Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. The purpose of the medical evaluation is to determine an employee's fitness for duty on hazardous waste sites; and to establish baseline medical data. The examinations include:

- Occupational/medical history review.
- Physical exam, including vital sign measurement.
- Spirometry testing.
- Eyesight testing.
- Audio testing (minimum baseline and exit, annual for employees routinely exposed to greater than 85db).
- EKG (for employees >40 yrs age or as medical conditions dictate).
- Chest X-ray (baseline and exit, and every 5 years).
- Blood biochemistry (including blood count, white cell differential count, serum multiplastic screening).
- Medical certification of physical requirements (i.e., sight, musculoskeletal, cardiovascular) for safe job performance and to wear respiratory protection





equipment.

In conformance with OSHA regulations, TurnKey-Benchmark will maintain and preserve medical records for a period of 30 years following termination of employment. Employees are provided a copy of the physician' post-exam report, and have access to their medical records and analyses.



6.0 SAFE WORK PRACTICES

All TurnKey-Benchmark employees shall conform to the following safe work practices during all on-site work activities conducted within the exclusion and contamination reduction zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth contact is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Respiratory protective equipment and clothing must be worn by all personnel entering the Site as required by the HASP or as modified by the Site safety officer. Excessive facial hair (i.e., beards, long mustaches or sideburns) that interferes with the satisfactory respirator-to-face seal is prohibited.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross contamination and need for decontamination.
- Medicine and alcohol can synergize the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the TurnKey-Benchmark occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during the workday.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.
- On-site personnel shall use the "buddy" system. No one may work alone (i.e., out of earshot or visual contact with other workers) in the exclusion zone.
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective Site operations.
- All employees have the obligation to immediately report and if possible, correct unsafe work conditions.
- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for TurnKey-Benchmark employees, as requested and required.

The recommended specific safety practices for working around the contractor's equipment (e.g., backhoes, bulldozers, excavators, drill rigs etc.) are as follows:

• Although the Contractor and subcontractors are responsible for their equipment and safe operation of the Site, TurnKey-Benchmark personnel are also

responsible for their own safety.

- Subsurface work will not be initiated without first clearing underground utility services.
- Heavy equipment should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated or if lines carry high voltage. The Site should also be sufficiently clear to ensure the project staff can move around the heavy machinery safely.
- Care should be taken to avoid overhead wires when moving heavy-equipment from location to location.
- Hard hats, safety boots and safety glasses should be worn at all times in the vicinity of heavy equipment. Hearing protection is also recommended.
- The work Site should be kept neat. This will prevent personnel from tripping and will allow for fast emergency exit from the Site.
- Proper lighting must be provided when working at night.
- Construction activities should be discontinued during an electrical storm or severe weather conditions.
- The presence of combustible gases should be checked before igniting any open flame.
- Personnel shall stand upwind of any construction operation when not immediately involved in sampling/logging/observing activities.
- Personnel will not approach the edge of an unsecured trench/excavation closer than 2 feet.



7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Equipment Selection

Personal protective equipment (PPE) will be donned when work activities may result in exposure to physical or chemical hazards beyond acceptable limits, and when such exposure can be mitigated through appropriate PPE. The selection of PPE will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Site, the task-specific conditions and duration, and the hazards and potential hazards identified at the Site.

Equipment designed to protect the body against contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories are consistent with United States Environmental Protection Agency (USEPA) Level of Protection designation:

- Level A: Should be selected when the highest level of respiratory, skin, and eye protection is needed.
- Level B: Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B protection is the minimum level recommended on initial Site entries until the hazards have been further defined by on-site studies. Level B (or Level A) is also necessary for oxygen-deficient atmospheres.
- Level C: Should be selected when the types of airborne substances are known, the concentrations have been measured and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.
- Level D: Should not be worn on any Site with elevated respiratory or skin hazards. This is generally a work uniform providing minimal protection.

OSHA requires the use of certain PPE under conditions where an immediate danger to life and health (IDLH) may be present. Specifically, OSHA 29 CFR 1910.120(g)(3)(iii) requires use of a positive pressure self-contained breathing apparatus, or positive pressure air-line respirator equipped with an escape air supply when chemical exposure levels present a substantial possibility of immediate serious injury, illness or death, or impair the ability to escape. Similarly, OSHA 29 CFR 1910.120(g)(3)(iv) requires donning totally-encapsulating



chemical protective suits (with a protection level equivalent to Level A protection) in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate serious illness, injury or death, or impair the ability to escape.

In situations where the types of chemicals, concentrations, and possibilities of contact are unknown, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components are detailed below for levels A/B, C, and D protection.

7.2 **Protection Ensembles**

7.2.1 Level A/B Protection Ensemble

Level A/B ensembles include similar respiratory protection; however, Level A provides a higher degree of dermal protection than Level B. Use of Level A over Level B is determined by: comparing the concentrations of identified substances in the air with skin toxicity data, and assessing the effect of the substance (by its measured air concentrations or splash potential) on the small area of the head and neck unprotected by Level B clothing. The recommended PPE for level A/B is:

- Pressure-demand, full-face piece self-contained breathing apparatus (MSHA/-NIOSH approved) or pressure-demand supplied-air respirator with escape selfcontained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totallyencapsulating chemical resistant suit. Level B incorporates hooded one-or twopiece chemical splash suit.
- Inner and outer chemical resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.



7.2.2 Level C Protection Ensemble

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air-purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances encountered. Respiratory protection will be used only with proper fitting, training and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if: oxygen content of the atmosphere is at least 19.5% in volume; substances are identified and concentrations measured; substances have adequate warning properties; the individual passes a qualitative fit-test for the mask; and an appropriate cartridge/canister is used, and its service limit concentration is not exceeded. Recommended PPE for Level C conditions includes:

- Full-face piece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the SSHO.
- Chemical-resistant clothing (hooded, one or two-piece chemical splash suit or disposable chemical-resistant one-piece suit).
- Inner and outer chemical-resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

An air-monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

7.2.3 Level D Protection Ensemble

As indicated above, Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, where there are no inhalable toxic substances and where the atmospheric contains at least 19.5% oxygen. Recommended PPE for Level D

includes:

- Coveralls.
- Safety boots/shoes.
- Safety glasses or chemical splash goggles.
- Hardhat.
- Optional gloves; escape mask; face shield.

7.2.4 Recommended Level of Protection for Site Tasks

Based on current information regarding both the contaminants suspected to be present at the Site and the various tasks that are included in the remedial activities, the minimum required levels of protection for these tasks shall be as identified in Table 4.



8.0 EXPOSURE MONITORING

8.1 General

Based on the results of historic sample analysis and the nature of the remaining contamination at the Site, the potential for organic vapors and/or particulates to be released to the air exists. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PELs) established by OSHA for the individual compounds (see Table 2 of the HASP), in which case respiratory protection will be required. Respiratory and dermal protection may be modified (upgraded or downgraded) by the SSHO based upon real-time field monitoring data.

8.1.1 On-Site Work Zone Monitoring

TurnKey personnel will conduct routine, real-time air monitoring during all intrusive construction phases such as excavation, backfilling, drilling, etc. The work area will be monitored at regular intervals using a photo-ionization detector (PID), combustible gas meter and a particulate meter. Observed values will be recorded and maintained as part of the permanent field record.

Additional air monitoring measurements may be made by TurnKey personnel to verify field conditions during subcontractor oversight activities. Monitoring instruments will be protected from surface contamination during use. Additional monitoring instruments may be added if the situations or conditions change. Monitoring instruments will be calibrated in accordance with manufacturer's instructions before use.

8.1.2 Off-Site Community Air Monitoring

In addition to on-site monitoring within the work zone(s), monitoring at the Community Air Monitoring will be completed in accordance with the CAMP, included in Appendix A-2 of this HASP. This will provide a real-time method for determination of vapor and/or particulate releases to the surrounding community as a result of ground intrusive investigation work.

Ground intrusive activities are defined by NYSDOH Generic CAMPand include soil/waste excavation and handling, test pitting or trenching, and the installation of soil



borings or monitoring wells. Non-intrusive activities include the collection of soil and sediment samples or the collection of groundwater samples from existing wells. Continuous monitoring is required for ground intrusive activities and periodic monitoring is required for non-intrusive activities. Periodic monitoring consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring while bailing a well, and taking a reading prior to leaving a sampling location. This may be upgraded to continuous if the sampling location is in close proximity to individuals not involved in the Site activity (i.e., on a curb of a busy street). The action levels below will be used during periodic monitoring.

8.2 Monitoring Action Levels

8.2.1 On-Site Work Zone Action Levels

The PID, or other appropriate instrument(s), will be used by TurnKey personnel to monitor organic vapor concentrations as specified in this HASP. Combustible gas will be monitored with the "combustible gas" option on the combustible gas meter or other appropriate instrument(s), as necessary. In addition, fugitive dust/particulate concentrations will be monitored during all intrusive activities (i.e., well/boring installation) using a real-time particulate monitor as specified in the CAMP. In the absence of such monitoring, appropriate respiratory protection for particulates shall be donned. Sustained readings obtained in the breathing zone may be interpreted (with regard to other Site conditions) as follows for TurnKey-Benchmark personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to 1 parts per million (ppm) above background on the photo-ionization detector (PID)) Continue operations under Level D
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings from >1 ppm to 5 ppm above background on the PID (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue operations under Level C.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of >5 ppm to 50 ppm above background on the PID – Discontinue operations, exit work zone and reassess, or continue operations under Level B, re-evaluate and alter (if possible) construction methods to achieve



lower vapor concentrations.

• Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the PID - Discontinue operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during RA activities. Action levels based on the instrument readings shall be as follows:

- Less than 10% lower explosive limit (LEL) Continue engineering operations with caution.
- 10-25% LEL Continuous monitoring with extreme caution, determine source/cause of elevated reading.
- Greater than 25% LEL Explosion hazard, evaluate source and leave the Work Zone.
- 19.5% 21% oxygen proceed with extreme caution; attempt to determine potential source of oxygen displacement.
- Less than 19.5% oxygen leave work zone immediately.
- 21-25% oxygen Continue engineering operations with caution.
- Greater than 25% oxygen Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities and during handling of Site soil/fill. Action levels based on the instrument readings shall be as follows:

- Less than 50 ug/m³ Continue field operations.
- 50-150 ug/m³ Don dust/particulate mask or equivalent
- Greater than 150 ug/m³ Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (i.e., wetting of excavated soils or tools at discretion of Site Safety and Health Officer).

Readings with the organic vapor analyzer, combustible gas meter, and particulate monitor will be recorded and documented on the appropriate Project Field Forms. All instruments will be field calibrated before use on a daily basis. Instrument calibration will be completed in accordance with the manufacturer's specifications, and the procedure will be documented on the appropriate Project Field Forms.



8.2.2 Community Air Monitoring Action Levels

In addition to the action levels prescribed in Section 8.2.1 for Benchmark personnel on-site, the following criteria shall also be adhered to for the protection of downwind receptors consistent with NYSDOH requirements (Appendix A-2):

O ORGANIC VAPOR PERIMETER MONITORING:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
- All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

• <u>Special Requirements for Work Within 20 Feet of Potentially Exposed</u> <u>Individuals or Structures</u>

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure



enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure (s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored Response levels and actions should be predetermined, as necessary, for each site.

Additionally, if following the cessation of work and efforts to abate the emission source are unsuccessful, and if sustained organic vapor levels exceed 25 ppm above background within the 20-foot zone for more than 30 minutes, then the **Major Vapor Emission Response Plan** (see below) will automatically be placed into effect.

0 MAJOR VAPOR EMISSION RESPONSE PLAN:

Upon activation, the following activities will be undertaken:

- 1. All Emergency Response Contacts as listed in this Health and Safety Plan and the Emergency Response Plan (Appendix A-1) will be advised.
- 2. The local police authorities will immediately be contacted by the Site Health and Safety Officer and advised of the situation.
- 3. The Site Safety and Health Officer will determine if site workers can safely undertake source abatement measures. Abatement measures may include covering the source area with clean fill or plastic sheeting, or consolidating contaminated materials to minimize surface area. The Site Safety and Health Officer will adjust worker personal protective





equipment as necessary to protect workers from over-exposure to organic vapors.

The following personnel are to be notified in the listed sequence in the event that a Major Vapor Emission Plan is activated:

Responsible Person	Contact	Phone Number
SSHO	Police	911
SSHO	NYSDEC Spills Hotline	(800) 457-7362

Additional emergency numbers are listed in the Emergency Response Plan included as Appendix A-1 of this HASP.

o **EXPLOSIVE VAPORS:**

- <u>Sustained</u> atmospheric concentrations of greater than 10% LEL in the work area Initiate combustible gas monitoring at the downwind portion of the Site perimeter.
- <u>Sustained</u> atmospheric concentrations of greater than 10% LEL at the downwind Site perimeter Halt work and contact local Fire Department.

O AIRBORNE PARTICULATE COMMUNITY AIR MONITORING

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the upwind and downwind perimeter of the exclusion zone. The monitoring will be performed using real-time monitoring equipment capable of measuring PM-10 and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

 If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m³) greater than the background (upwind perimeter) reading for the 15minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression provided that the downwind PM-10 particulate levels do not



exceed 150 ug/m^3 above the upwind level and/or background levels and that visible dust is not migrating from the work area.

If, after implementation of dust suppression techniques downwind PM-10 levels are greater than 150 ug/m³ above the upwind level, work activities must be stopped and dust suppression controls re-evaluated. Work can resume provided that supplemental dust suppression measures and/or other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m³ of the upwind level and in preventing visible dust migration.

Pertinent emergency response information including the telephone number of the Fire Department is included in the Emergency Response Plan (Appendix A-1 of this HASP).

9.0 SPILL RELEASE/RESPONSE

This section of the HASP describes the potential for and procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The purpose of this section of the HASP is to plan appropriate response, control, countermeasures and reporting, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The spill containment program addresses the following elements:

- Potential hazardous material spills and available controls.
- Initial notification and evaluation.
- Spill response.
- Post-spill evaluation.

9.1 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous material and oil/petroleum spills at this Site. For the purpose of this evaluation, hazardous materials posing a significant spill potential are considered to be:

- CERCLA Hazardous Substances as identified in 40 CFR Part 302, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Extremely Hazardous Substances as identified in 40 CFR Part 355, Appendix A, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).
- Hazardous Chemicals as defined under Section 311(e) of the Emergency Planning and Community Right-To-Know Act of 1986, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Toxic Chemicals as defined in 40 CFR Part 372, where such chemicals are present or will be stored in excess of 10,000 lbs.
- Chemicals regulated under 6NYCRR Part 597, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).

Oil/petroleum products are considered to pose a significant spill potential whenever the following situations occur:

- The potential for a "harmful quantity" of oil (including petroleum and nonpetroleum-based fuels and lubricants) to reach navigable waters of the U.S. exists (40 CFR Part 112.4). Harmful quantities are considered by USEPA to be volumes that could form a visible sheen on the water or violate applicable water quality standards.
- The potential for any amount of petroleum to reach any waters of NY State, including groundwater, exists. Petroleum, as defined by NY State in 6NYCRR Part 612, is a petroleum-based heat source, energy source, or engine lubricant/maintenance fluid.
- The potential for any release, to soil or water, of petroleum from a bulk storage facility regulated under 6NYCRR Part 612. A regulated petroleum storage facility is defined by NY State as a site having stationary tank(s) and intra-facility piping, fixtures and related equipment with an aggregate storage volume of 1,100 gallons or greater.

The evaluation indicates that, based on Site history and decommissioning records, a hazardous material spill and/or a petroleum product spill is not likely to occur during RA efforts.

9.2 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. The worker will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries. The Emergency Response Plan presented in Appendix A-1 of this HASP will immediately be implemented if an emergency release has occurred.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the Site owner and NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies (e.g., USEPA) are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

9.3 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be roped, ribboned, or otherwise blocked off to prevent unauthorized access.
- Appropriate PPE, as specified by the SSHO, will be donned before entering the spill area.
- Ignition points will be extinguished/removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, the Contractor will maintain a Spill Control and Containment Kit in the Field Office or other readily accessible storage location. The kit will consist of, at a minimum, a 50 lb. bag of "speedy dry" granular absorbent material, absorbent pads, shovels, empty 5-gallon pails and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal (NYSDEC approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the Site. The response contractor may use heavy equipment (e.g., excavator, backhoe, etc.) to berm the soils surrounding the spill Site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/cleanup contractors in the Western New York area that may be contacted for assistance include:

- NYTECH, Inc.: (585) 436-5660 or (1-800-807-7455)
- The Environmental Service Group of NY, Inc.: (716) 695-6720

9.4 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared as indicated in Section 9.2. The report will identify the root cause of the spill, type and amount of material released, date/time of release, response actions, agencies notified and/or involved in cleanup, and procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.



10.0 HEAT/COLD STRESS MONITORING

Since some of the work activities at the Site can occur in the summer and fall/winter months, measures will be taken to minimize heat/cold stress to TurnKey-Benchmark employees. The Site Safety and Health Officer and/or his or her designee will be responsible for monitoring TurnKey-Benchmark field personnel for symptoms of heat/cold stress.

10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, a common and potentially serious illnesses often encountered at construction, landfill, waste disposal, industrial or other unsheltered sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain temperature equilibrium (via evaporation and convection), and require increased energy expenditure due to its bulk and weight.

Proper training and preventive measures will mitigate the potential for serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat (i.e., eight fluid ounces must be ingested for approximately every 1 lb of weight lost). The normal thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost perspiration. When heavy sweating occurs, workers should be encouraged to drink more.
- Train workers to recognize the symptoms of heat related illness.





Heat-Related Illness - Symptoms:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include: muscle spasms; pain in the hands, feet and abdomen.
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness; nausea; fainting.
- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are: red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest periods stay the same, if the pulse rate is 100 beats per minute at the beginning of the nest rest period, the following work cycle should be further shortened by 33%.
- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period remains the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the work cycle may be further shortened by 33%. Oral temperature should be measured at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No TurnKey-Benchmark employee will be permitted to continue wearing semi-permeable or impermeable garments when his/her oral temperature exceeds 100.6 degrees Fahrenheit.


10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:
 - 1) **Frost nip** This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102 to 108 degrees Fahrenheit) and drinking a warm beverage. Do not rub skin to generate friction/ heat.
 - 2) **Superficial Frostbite** This is the second stage of the freezing process. It is characterized by a whitish gray area of tissue, which will be firm to the touch but will yield little pain. The treatment is identical for Frost nip.
 - 3) **Deep Frostbite** In this final stage of the freezing process the affected tissue will be cold, numb and hard and will yield little to no pain. Treatment is identical to that for Frost nip.
- **Hypothermia** is a serious cold stress condition occurring when the body loses heat at a rate faster than it is produced. If untreated, hypothermia may be fatal. The stages of hypothermia may not be clearly defined or visible at first, but generally include:
 - 1) Shivering
 - 2) Apathy (i.e., a change to an indifferent or uncaring mood)
 - 3) Unconsciousness
 - 4) Bodily freezing

Employees exhibiting signs of hypothermia should be treated by medical professionals. Steps that can be taken while awaiting help include:

- 1) Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
- 2) Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine) and a warm water bath (102 to 108 degrees Fahrenheit).
- 3) Perform passive re-warming with a blanket or jacket wrapped around

the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Education of workers to recognize the symptoms of frostbite and hypothermia.
- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in heated areas, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if hypothermia has set in).
- For monitoring the body's recuperation from excess cold, oral temperature recordings should occur:
 - At the Site Safety Technicians discretion when suspicion is based on changes in a worker's performance or mental status.
 - At a workers request.
 - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind chill less than 20 degrees Fahrenheit or wind chill less than 30 degrees Fahrenheit with precipitation).
 - As a screening measure, whenever anyone worker on-site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will not be allowed to return to work for 48 hours without the recommendation of a qualified medical doctor.

11.0 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for construction activities will be established on a daily basis and communicated to all employees and other Site users by the SSHO. It shall be each Contractor's Site Safety and Health Officer's responsibility to ensure that all Site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- Exclusion Zone ("Hot Zone") The area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.
- Contamination Reduction Zone The zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated.
- Support Zone The part of the site that is considered non-contaminated or "clean." Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

In the absence of other task-specific work zone boundaries established by the SSHO, the following boundaries will apply to all investigation and construction activities involving disruption or handling of Site soils or groundwater:

- Exclusion Zone: 50 foot radius from the outer limit of the sampling/construction activity.
- Contaminant Reduction Zone: 100 foot radius from the outer limit of the sampling/construction activity.
- Support Zone: Areas outside the Contaminant Reduction Zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the SSHO. Only personnel who are essential to the completion of the task will be allowed access to these areas if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the SSHO.

The SSHO will maintain a Health and Safety Logbook containing the names of TurnKey-Benchmark workers and their level of protection. The zone boundaries may be changed by the SSHO as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.



12.0 DECONTAMINATION

12.1 Decontamination for TurnKey-Benchmark Employees

The degree of decontamination required is a function of a particular task and the environment within which it occurs. The following decontamination procedure will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions that may arise at the Site. All TurnKey-Benchmark personnel on-site shall follow the procedure below, or the Contractor's procedure (if applicable), whichever is more stringent.

Station 1 - Equipment Drop: Deposit visibly contaminated (if any) re-useable equipment used in the contamination reduction and exclusion zones (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic sheeting.

Station 2 - Boots and Gloves Wash and Rinse: Scrub outer boots and outer gloves. Deposit tape and gloves in waste disposal container.

Station 3 - Tape, Outer Boot and Glove Removal: Remove tape, outer boots and gloves. Deposit tape and gloves in waste disposal container.

Station 4 - Canister or Mask Change: If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot cover donned, and worker returns to duty.

Station 5 - Outer Garment/Face Piece Removal: Protective suit removed and deposited in separate container provided by Contractor. Face piece or goggles are removed if used. Avoid touching face with fingers. Face piece and/or goggles deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 6 - Inner Glove Removal: Inner gloves are the last personal protective equipment to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in waste disposal container.

Following PPE removal, personnel shall wash hands, face and forearms with absorbent wipes. If field activities proceed for six consecutive months or longer, shower facilities will be provided for worker use in accordance with OSHA 29 CFR 1910.120(n).





12.2 Decontamination for Medical Emergencies

In the event of a minor, non-life threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (e.g., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a Site contaminant would be considered "Immediately Dangerous to Life or Health."

12.3 Decontamination of Field Equipment

Decontamination of heavy equipment will be conducted by the Contractor in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone. As a minimum, this will include manually removing heavy soil contamination, followed by steam cleaning on an impermeable pad.

Decontamination of all tools used for sample collection purposes will be conducted by TurnKey-Benchmark personnel. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal), which will aid in the decontamination effort. Any tool or part of a tool made of porous, absorbent material (i.e., wood) will be placed into suitable containers and prepared for disposal.

Decontamination of bailers, split-spoons, spatula knives, and other tools used for environmental sampling and examination shall be as follows:

- Disassemble the equipment
- Water wash to remove all visible foreign matter.
- Wash with detergent.
- Rinse all parts with distilled-deionized water.
- Allow to air dry.
- Wrap all parts in aluminum foil or polyethylene.

13.0 CONFINED SPACE ENTRY

OSHA 29 CFR 1910.146 identifies a confined space as a space that is large enough and so configured that an employee can physically enter and do assigned work, has limited or restricted means for entry and exit, and is not intended for continuous employee occupancy. Confined spaces include, but are not limited to, trenches, storage tanks, process vessels, pits, sewers, tunnels, underground utility vaults, pipelines, sumps, wells, and excavations.

Confined space entry by TurnKey-Benchmark employees is not anticipated to be necessary at this SiteIn the event that the scope of work changes or confined space entry appears necessary, the Project Manager will be consulted to determine if feasible engineering alternatives to confined space entry can be implemented. If confined space entry by TurnKey-Benchmark employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed and a confinedspace entry permit will be issued through TurnKey-Benchmark's corporate Health and Safety Director. TurnKey-Benchmark employees shall not enter a confined space without these procedures and permits in place.



14.0 FIRE PREVENTION AND PROTECTION

14.1 General Approach

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper Site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

14.2 Equipment and Requirements

Fire extinguishers will be provided by each Contractor and are required on all heavy equipment and in each field trailer. Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary. Recharge or replacement shall be mandatory immediately after each use.

14.3 Flammable and Combustible Substances

All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons. All tanks, containers and pumping equipment, whether portable or stationary, used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the National Fire Protection Association.





14.4 Hot Work

If the scope of work necessitates welding or blowtorch operation, the hot work permit presented in Appendix A-3 of the HASP will be completed by the SSHO and reviewed/issued by the Project Manager.

15.0 EMERGENCY INFORMATION

In accordance with OSHA 29 CFR Part 1910, an Emergency Response Plan is attached to this HASP as Appendix A-1. The hospital route map is presented within Appendix A-1 of the HASP.





16.0 REFERENCES

- 1. NYSDOH Generic Community Air Monitoring Plan of the Final DER-10, Technical Guidance for Site Investigaton and Remediation, dated May 2010.
- 2. Haley & Aldrich, of New York, *Phase I/II Environmental Site Assessment Report*, 500 Union Street, Spencerport, NY, prepared for Rite Aid Corporation, November 1998.
- 3. TurnKey Environmental Restoration, LLC, *Phase I Environmental Site Assessment Report*, 500 Union Street, Spencerport, NY, prepared for 1093 Group, LLC, April 2008.
- 4. TurnKey Environmental Restoration, LLC, *Phase II Site Investigation Report*, 500 South Union Street Site, Spencerport, NY, prepared for 1093 Group, LLC, April 2008.
- 5. TurnKey Environmental Restoration, LLC, *Additional Subsurface Investigation Letter Report*, 500 South Union Street Site, Spencerport, NY, prepared for Ellicott Development Company, July 10, 2008.
- 6. TurnKey Environmental Restoration, LLC, *Final Remedial Investigation/Alternatives Analysis Report*, 500 South Union Street Site, Spencerport, NY, prepared for Eyezon Associates, Inc., November 2012.
- 7. TurnKey Environmental Restoration, LLC, Remedial Action Work Plan, 500 South Union Street Site, Spencerport, New York, prepared for Eyezon Associates, Inc., Revised April 2014.







CONSTITUENTS OF POENTIAL CONCERN (COPCs) & OBSERVED CONCENTRATIONS BY MEDIA

Health and Safety Plan 500 South Union Street Site Spencerport, New York BCP Site No. C828153

Parameter	Soil (mg/Kg)	Groundwater (ug/L)			
Volatile Organic Compounds					
Tetrachloroethene	14.67	4000 D			
Trichloroethene	0.05	180 D			
cis-1,2-Dichloroethene	0.06	510 D			
Vinyl Chloride	ND	38			
Semi-Volatile Organic Compounds					
Benzo(a)pyrene	1.5 D,J	ND			

Notes:

J = Estimated concentration.

D = Compounds identified in an analysis at the secondary dilution factor.

ND = Not detected.

NA = Not analyzed.



TOXICITY AND EXPOSURE DATA FOR CONSTITUENTS OF POTENTIAL CONCERN

Health and Safety Plan 500 South Union Street Site Spencerport, New York BCP Site No. C828153

Constituents of Potential Concern	Inhalation Hazar				
Constituents of Potential Concern	PEL	TLV	IDEN		
Volatile Organic Compounds (ppm)):				
Tetrachloroethene	100	25	150, Ca		
Trichloroethene	100	10	1000, Ca		
cis-1,2-Dichloroethene 200		200	1000		
Vinyl Chloride	1	1	Са		
Benzene	1	0.5	500, Ca		
Ethylbenzene	100	20	800		
Xylene	100 100		900		
Semi-Volatile Organic Compounds (ppm):					
Benzo(a)pyrene					

Notes:

PEL - Permissible Exposure Limit, established by OSHA, equals the max. exposure concentration allowable for 8 hours per day @ 40 hrs. per week.

TLV - Threshold Limit Value, established by ACGIH, equals the maximum exposure concentration allowable for 8 hours per day @ 40 hrs. per week.

IDLH - Immediately Dangerous to Life or Health

Ca - NIOSH considers constituent to be a potential carcinogen.

ND - IDLH has not yet been established.

NA - Not Available. Exposure should be minimized to the extent feasible through appropriate engineering controls & PPE.



POTENTIAL ROUTES OF EXPOSURE TO CONSTITUENTS OF CONCERN

Health and Safety Plan 500 South Union Street Site Spencerport, New York BCP Site No. C828153

Activity	Direct Contact with Surface and Subsurface Soils	Direct Contact with Groundwater	Inhalation of Vapors or Dust
Surface Soil Excavation & Sampling	Х		Х
Intrusive Activities	Х	Х	Х
Sampling of Monitoring Wells		х	
Injection Point Work	Х	Х	



REQUIRED LEVELS OF PERSONNEL PROTECTION

Health and Safety Plan 500 South Union Street Site Spencerport, New York BCP Site No. C828153

Activity	Respiratory Protection 1	Clothing	Gloves 2	Boots 2, 3	Other Required PPE/Modifications 2, 4
Remedial Action Activities					
1. Surface and Subsurface Soil Excavation	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
2. Monitoring Well Sampling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
3. Injection Point Work	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	SGSS

Notes:

1. Respiratory equipment shall conform to guidelines presented in Section 7.0 of this HASP. The Level C requirement is an air-purifying respirator equiped with organic compound/acid gas/dust cartridge.

2. HH = hardhat; L= Latex; L/N = latex inner glove, nitrile outer glove; N = Nitrile; S = Saranex; SG = safety glasses; SGSS = safety glasses with sideshields; STSS = steel toe safety shoes.

3. Latex outer boot (or approved overboot) required whenever contact with contaminated materials may occur. SSHO may downgrade to STSS (steel-toed safety shoes) if contact will be limited to cover/replacement soils.

4. Dust masks shall be donned as directed by the SSHO (site safety and health officer) or site safety technician whenever potentially contaminated airborne particulates (i.e., dust) are present in significant amounts in the breathing zone. Goggles may be substituted with safety glasses w/side-shields whenever contact with contaminated liquids is not anticipated.

FIGURES



FIGURE 1



NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF TURNKEY ENVIRONMENTAL RESTORATION, LLC.



END: BROWNFIELD CLEANUP PROGRAM BOUNDARY		anta		VOT TO BE
PARCEL BOUNDARY		2558 HAMBURG TURN SUITE 300 BUFFALO, NY 14218 (716) 856-0635		tion contained hereon is n tion, LLC.
		TURNKEY Ewronmental Rescontron, LLC	JOB NO.: 0188-013-001	F TO RECALL AT ANY TIME. INFORMA IF TURNKEY ENVIRONMENTAL RESTORA
	SITE PLAN	HEALTH AND SAFETY PLAN 500 SOUTH UNION STREET SITE SPENCERPORT, NEW YORK BCP SITE NO. C828153 PREAMED FOR	EYEZON ASSOCIATES, INC.	OF TURNKEY ENVIRONMENTAL RESTORATION, LLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OI
SCALE: 1 INCH = 40 FEET SCALE IN FEET (approximate)		FIGURE 2		DISCLAIMER: PROPERTY C DISCLOSED O



APPENDIX A-1

EMERGENCY RESPONSE PLAN



HASP APPENDIX A-1

EMERGENCY RESPONSE PLAN

500 SOUTH UNION STREET SITE BCP SITE NO. C828153 SPENCERPORT, NEW YORK

December 2014

0188-013-001

Prepared for:

Eyezon Associates, Inc.

Prepared By:



APPENDIX A-1: EMERGENCY RESPONSE PLAN HEALTH AND SAFETY PLAN

500 South Union Street Site BCP Site No. C828153

Table of Contents

1.0	GENERAL
2.0	PRE-EMERGENCY PLANNING
3.0	ON-SITE EMERGENCY RESPONSE EQUIPMENT
4.0	EMERGENCY PLANNING MAPS 4
5.0	EMERGENCY CONTACTS
6.0	EMERGENCY ALERTING & EVACUATION
7.0	EXTREME WEATHER CONDITIONS7
8.0	EMERGENCY MEDICAL TREATMENT & FIRST AID
9.0	EMERGENCY RESPONSE CRITIQUE & RECORD KEEPING
10.0	EMERGENCY RESPONSE TRAINING

LIST OF FIGURES

Figure A-1 Hospital Route Map

1.0 GENERAL

This report presents the site-specific Emergency Response Plan (ERP) referenced in the Health and Safety Plan (HASP) prepared for the 500 South Union Street Site in the Town of Ogden, Village of Spencerport, Monroe County, New York. This appendix of the HASP describes potential emergencies that may occur at the Site; procedures for responding to those emergencies; roles and responsibilities during emergency response; and training all workers must receive in order to follow emergency procedures. This ERP 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 ERP is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

- Pre-emergency planning.
- Personnel roles, lines of authority, and communication.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Evacuation routes and procedures.
- Decontamination procedures.
- Emergency medical treatment and first aid.
- Emergency alerting and response procedures.
- Critique of response and follow-up.
- Emergency personal protective equipment (PPE) and equipment.



2.0 PRE-EMERGENCY PLANNING

This Site has been evaluated for potential emergency occurrences, based on Site hazards, the required work tasks, the Site topography, and prevailing weather conditions. The results of that evaluation indicate the potential for the following site emergencies to occur at the locations indicated.

Type of Emergency:

- 1. Medical, due to physical injury
- 2. Fire, due to use of gasoline on-site by vehicles

Source of Emergency:

- 1. Slip/trip/fall
- 2. Fire

Location of Source:

1. Non-specific



3.0 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 available on the Site is listed below. The equipment inventory and storage locations are based on the potential emergencies described above. 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 but not ordinarily stocked.

Any additional PPE required and stocked for emergency response is also listed below. During an emergency, the Emergency Response Coordinator (ERC) is responsible for specifying the level of PPE required for emergency response. At a minimum, PPE used by emergency responders will comply with Section 7.0, Personal Protective Equipment, of this HASP. Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Emergency Equipment	Quantity	Location
First Aid Kit	1	Site Vehicle
Chemical Fire Extinguisher	2 (minimum)	All heavy equipment and Site Vehicle

Emergency PPE	Quantity	Location
Full-face respirator	1 for each worker	Site Vehicle
Chemical-resistant suits	4 (minimum)	Site Vehicle



4.0 EMERGENCY PLANNING MAPS

An area-specific map of the Site will be developed on a daily basis during performance of field activities. The map will be marked to identify critical on-site emergency planning information including: emergency evacuation routes, a place of refuge, an assembly point, and the locations of key Site emergency equipment. Site zone boundaries will be shown to alert responders to known areas of contamination. There are no major topographical features, however the direction of prevailing winds/weather conditions that could affect emergency response planning are also marked on the map. The map will be posted at site-designated place of refuge and inside the TurnKey personnel field vehicle.



5.0 EMERGENCY CONTACTS

The following identifies the emergency contacts for this Benchmark-TurnKey ERP.

Emergency Telephone Numbers:

Project Manager: Michael Lesakowski

Work: (716) 856-0599 Mobile: (716) 818-3954

Corporate Health and Safety Director: Thomas H. Forbes

Work: (716) 856-0599 Mobile: (716) 864-1730

Site Safety and Health Officer (SSHO): Bryan C. Hann

Work: (716) 856-0635 Mobile: (716) 870-1165

Alternate SSHO: Richard L. Dubisz

Work: (716) 856-0635 Mobile: (716) 998-4334

STRONG MEMORIAL HOSPITAL (ER):	(585) 275-4551
FIRE:	911
AMBULANCE:	911
POLICE:	911
STATE EMERGENCY RESPONSE HOTLINE:	(800) 457-7362
NATIONAL RESPONSE HOTLINE:	(800) 424-8802
NYSDOH (ROCHESTER OFFICE):	(585) 423-8041
NYSDEC:	(585) 226-2466
NYSDEC 24-HOUR SPILL HOTLINE:	(800) 457-7252
NYSDEC Project Manager: Charlotte B. Theobold	(585) 226-5354
NYSDOH Project Manager: Stephanie Selmer	(518) 402-7860
Monroe County Health Department Project Manager: John Frazer	(585) 753-5476
The Site location is:	
500 South Union Street Site	

500 South Union Street 500 South Union Street Spencerport, New York 14559 Site Phone Number: (Insert Cell Phone or Field Trailer):



6.0 EMERGENCY ALERTING & EVACUATION

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Two-way radio headsets or field telephones are often used when work teams are far from the command post. Hand signals and air-horn blasts are also commonly used. Every system <u>must</u> have a backup. It shall be the responsibility of each contractor's SSHO to ensure an adequate method of internal communication is understood by all personnel entering the Site. Unless all personnel are otherwise informed, the following signals shall be used.

- 1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site excavation.
- 2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/ everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

If evacuation notice is given, site workers leave the worksite with their respective buddies, if possible, by way of the nearest exit. Emergency decontamination procedures detailed in Section 12.0 of the HASP are followed to the extent practical without compromising the safety and health of site personnel. The evacuation routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by rehearsals and inputs from emergency response organizations. Wind direction indicators are located so that workers can determine a safe up wind or cross wind evacuation route and assembly area if not informed by the emergency response coordinator at the time the evacuation alarm sounds. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the construction SSHO to review evacuation routes and procedures as necessary and to inform all TurnKey-Benchmark workers of any changes.

Personnel exiting the site will gather at a designated assembly point. To determine that everyone has successfully exited the site, personnel will be accounted for at the assembly site. If any worker cannot be accounted for, notification is given to the SSHO so that appropriate action can be initiated. Contractors and subcontractors on this Site have coordinated their emergency response plans to ensure that these plans are compatible and that source(s) of potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying on them.



7.0 EXTREME WEATHER CONDITIONS

In the event of adverse weather conditions, the SSHO in conjunction with the Contractor's SSHO will determine if engineering operations can continue without sacrificing the health and safety of Site personnel. Items to be considered prior to determining if work should continue include but are not limited to:

- Potential for heat/cold stress.
- Weather-related construction hazards (e.g., flooding or wet conditions producing undermining of structures or sheeting, high wind threats, etc).
- Limited visibility.
- Potential for electrical storms.
- Limited site access/egress (e.g., due to heavy snow)



8.0 EMERGENCY MEDICAL TREATMENT & FIRST AID

Personnel Exposure:

The following general guidelines will be employed in instances where health impacts threaten to occur acute exposure is realized:

- <u>Skin Contact</u>: Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Strong Memorial Hospital.
- <u>Inhalation</u>: Move to fresh air and, if necessary, transport to Strong Memorial Hospital.
- Ingestion: Decontaminate and transport to Strong Memorial Hospital.

Personal Injury:

Minor first-aid will be applied on-site as deemed necessary. In the event of a life threatening injury, the individual should be transported to Lakeside Memorial Hospital via ambulance. The SSHO will supply available chemical specific information to appropriate medical personnel as requested.

First aid kits will conform to Red Cross and other applicable good health standards, and shall consist of a weatherproof container with individually sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the SSHO to ensure that the expended items are replaced.

Directions to Strong Memorial Hospital (see Figure A-1):

The following directions describe the best route from the Site to Strong Memorial Hospital in Rochester, New York (approximately 12 miles):

- Travel south on South Union Street (NY-259) toward Nichols St. (NY-31)
- Merge onto NY-531 (Spencerport Expressway) toward I-490
- Take the I-490E Rochester exit to the left onto I-490E
- Take Exit 9B (I-390S/Airport) onto I-390S
- Take Exit 17 (RT-383/Scottsville Rd)
- Turn Left onto Scottsville Rd (RT-383)
- Continue on Elmwood Ave
- Turn Left to stay on Elmwood Ave
- The hospital is on the right at 601 Elmwood Ave.
- Follow signs to the ER



9.0 EMERGENCY RESPONSE CRITIQUE & RECORD KEEPING

Following an emergency, the SSHO and Project Manager shall review the effectiveness of this Emergency Response Plan (ERP) in addressing notification, control and evacuation requirements. Updates and modifications to this ERP shall be made accordingly. It shall be the responsibility of each contractor to establish and assure adequate records of the following:

- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by the client.
- Records and reports required by local, state, federal and/or international agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Safety training.



10.0 Emergency Response Training

All persons who enter the worksite, including visitors, shall receive a site-specific briefing from the SSHO regarding anticipated emergency situations and emergency procedures. Where this Site relies on off-site organizations for emergency response, the training of personnel in those offsite organizations has been evaluated and is deemed adequate for response to this Site.



FIGURES





APPENDIX A-2

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN



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

Overview

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

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

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

Community Air Monitoring Plan

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

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

Periodic monitoring for VOCs will be required during <u>non-intrusive</u> activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or
overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

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

December 2009

Appendix 1B Fugitive Dust and Particulate Monitoring

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

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

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

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

- (a) Objects to be measured: Dust, mists or aerosols;
- (b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);

(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;

(d) Accuracy: +/-5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);

- (e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;

(h) Logged Data: Each data point with average concentration, time/date and data point number

(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;

(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;

(1) Operating Temperature: -10 to 50° C (14 to 122° F);

(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

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

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

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

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

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

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

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

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

APPENDIX A-3

HOT WORK PERMIT FORM





PART 1 - INFORMATION	
Issue Date:	
Date Work to be Performed: Start:	Finish (permit terminated):
Performed By:	
Work Area:	
Object to be Worked On:	
PART 2 - APPROVAL	
(for 1, 2 or 3: mark Yes, No or NA)*	
Will working be on or in:	Finish (permit terminated):
1. Metal partition, wall, ceiling covered by combustible material?	yes no
2. Pipes, in contact with combustible material?	yes no
3. Explosive area?	yes no
 * = If any of these conditions exist (marked "yes"), a permit will not be Thomas H. Forbes (Corporate Health and Safety Director). Requ PART 3 - REQUIRED CONDITIONS** 	e issued without being reviewed and approved by ired Signature below.
(Check all conditions that must be met)	
PROTECTIVE ACTION	PROTECTIVE EQUIPMENT
Specific Risk Assessment Required	Goggles/visor/welding screen
Fire or spark barrier	Apron/fireproof clothing
Cover hot surfaces	Welding gloves/gauntlets/other:
Move movable fire hazards, specifically	Wellintons/Knee pads
Erect screen on barrier	Ear protection: Ear muffs/Ear plugs
Restrict Access	B.A.: SCBA/Long Breather
Wet the ground	Respirator: Type:
Ensure adequate ventilation	Cartridge:
Provide adequate supports	Local Exhaust Ventilation
Cover exposed drain/floor or wall cracks	Extinguisher/Fire blanket
Fire watch (must remain on duty during duration of permit)	Personal flammable gas monitor
Issue additional permit(s):	
Other precautions:	
** Permit will not be issued until these conditions are m	et.
SIGNATURES	
Orginating Employee:	Date:
Project Manager:	Date:
Part 2 Approval:	Date:

APPENDIX A-4

REGENESIS 3-D MICROEMULSION





FEATURES

PRODUCT

HRC ADVANCED

Achieve wide-area, rapid and sustai ned reductive dechlorination with continuous distribution and staged hydrogen release

PRODUCT COMPOSITION

• Three Stage Electron Donor Release -FIGURE 1: THE 3-D MICROEMULSION MOLECULAR Immediate, Mid-Range and Long-Term Hydrogen Production STRUCTURE - Provides free lactic acid, controlled-release lactic acid and long release fatty acids for effective hydrogen production for periods of Fatty Acids up to 3 to 5 years. Low-Cost - 3-D Microemulsion is 25ϕ to 42ϕ per pound as applied • Maximum and Continuous Distribution via Micellar Transport - Unlike oil products, 3DMe forms micelles which are mobile in groundwater and significantly enhance electron donor distribution after injection. Wide-Area/High Volume Microemulsion Application - High volume application increases contact with contaminants and reduces number of injection points required for treatment minimizes overall project cost.

3-D Microemulsion (3DMe)[™] is a form of HRC Advanced[®] and has a molecular structure specifically designed to maximize the costeffective anaerobic treatment of contaminants in subsurface soils and groundwater. This structure (patent pending) is composed of free lactic acid, controlled-release lactic acid (polylactate) and certain fatty acid components which are esterified to a carbon backbone molecule of glycerin (Figure 1).

3DMe produces a sequential, staged release of its electron donor components. The immediately available free lactic acid is fermented rapidly while the controlled-release lactic acid is metabolized at a more controlled rate. The fatty acids are converted to hydrogen over a mid to long-range timeline giving 3DMe an exceptionally long electron donor release profile (Figure 2). This staged fermentation provides an immediate, mid-range and very long-term, controlled-release supply of hydrogen (electron donor) to fuel the reductive dechlorination process.

Typical 3DMe single application longevity is rated at periods of up to 3 to 5 years. With 5 years occurring under optimal conditions, e.g. low permeability, low consumption environments.



3DMe applications can be configured in several different ways including: grids, barriers and excavations. The material itself can be applied to the subsurface through the use of direct-push injection, hollow-stem auger, existing wells or re-injection wells.

3DMe is typically applied in high-volumes as an emulsified, micellar suspension (microemulsion). The microemulsion is easily pumped into the subsurface and is produced on-site by mixing specified volumes of water and delivered 3DMe concentrate. Detailed preparation and installation instructions are available at www.regenesis.com.

3DMe is usually applied throughout the entire vertical thickness of the determined treatment area. Once injected, the emulsified material moves out into the subsurface pore spaces via micellar transport, eventually coating most all available surfaces. Over time the released soluble components of 3-D Microemulsion are distributed within the aquifer via the physical process of advection and the concentration driven forces of diffusion.

MORE ON MICELLES

Micelles (Figure 3) are groups (spheres) of molecules with the hydrophilic group facing out to the water and the "tails" or lipophilic moiety facing in. They are formed during the 3-D Microemulsion emulsification process and provide the added benefit of increased distribution via migration to areas of lower concentration

FIGURE 3: MICELLE REPRESENTATION





3-D Microemulsion is delivered in 55 gallon drums, 300 gallon totes, tankers or buckets.

PERFORMANCE

ON APPLICATIONS

MORE

Case Study #1

A site in Massachusetts showed high levels of PCE and its daughter products TCE and cis-DCE which had been consistently present for more than two years. 3DMe was applied in a grid configuration around monitoring well #16. In Figure 4, the contaminant concentration results indicate a rapid decrease in the parent product PCE and evidence of reductive dechlorination as demonstrated by the relative increases in daughter products TCE and cis-DCE.



Case Study #2

A site in Florida was characterized with PCE contamination approaching 225 ug/L A total of 1,080 pounds of 3DMe was applied via 16 direct-push injection points to reduce PCE concentrations. Monitoring results in well MW-103 indicated a PCE reduction of approximately 67% within 75 days of the 3DMe application. PCE concentrations continued to decline by 96% one year after application and daughter products remained at low levels. Total Organic Carbon (TOC) levels remained elevated at 17-19 mg/L after 275 days demonstrating the longevity of 3DMe (Figure 5).

WWW.REGENESIS.COM

10

DISTRIBUTION

AND

APPLICATION





in high-volumes for maximum subsurface distribution.



The microemulsion is easily prepared on-site and applied 3-D Microemulsion is typically applied through permanent wells or by using direct-push injection.

11

REGENESIS 3-D Microemulsion[®] Factory Emulsified

Factory Emulsified, pH Neutral, Staged Release, Electron Donor Emulsion

PRODUCT APPLICATION INSTRUCTIONS

3-D Microemulsion[®] Factory Emulsified

As delivered, the 3-D Microemulsion factory emulsified product is a significant change compared to the physical state of standard 3-D Microemulsion. Whereas the standard 3-D Microemulsion is delivered in a concentrate form that requires an emulsification step prior to application, factory emulsified 3-D Microemulsion is delivered as a ready-to-apply, factory emulsion. It does not require shearing or any another other emulsion making steps. The only pre-application requirement is a quick stir and any required/recommended dilution of the factory emulsified 3-D Microemulsion with an appropriate volume of clear water.

Material Overview Handling and Safety

3-D Microemulsion factory emulsified is shipped and delivered as an emulsion of 2 part water to 3 parts active ingredient. Packaging is available in 275 gallon totes and/or 55 gallon drums.

- Each tote typically has a gross weight of 2,000 pounds
- Each drum has a weight of 400 pounds

At room temperature, 3-D Microemulsion factory emulsified is a liquid material with an appearance and viscosity roughly equivalent to milk. The microemulsion is <u>not</u> temperature sensitive above 50°F (10°C). If the user plans to apply the product in cold weather, consideration should be given to warming the material to above 50°F so that it can be more easily handled. The material should be stored in a warm, dry place. It is common for stored factory emulsified 3-D Microemulsion to settle somewhat in the container while in transit, a quick pre-mix stir using a hand held drill, equipped with paint mixer attachment will rapidly re-homogenize the microemulsion. Factory emulsified 3-D Microemulsion is non-toxic, however field personnel should take precautions while handling and applying the material. Field personnel should use appropriate personal protection equipment (PPE) including eye protection. Gloves should be used as appropriate based on the exposure duration and field conditions. A Material Safety Data Sheet (MSDS) is provided with each shipment. Personnel who operate field equipment during the installation process should have appropriate training, supervision, and experience and should review the MSDS prior to site operations.



PRODUCT APPLICATION INSTRUCTIONS



3-D Microemulsion® Factory Emulsified Field Homogenization using a Cordless Drill Equipped with a Paint Mixing Attachment

Design and Specifications

Designs for 3-D Microemulsion factory emulsified remain unchanged from standard 3-D Microemulsion. An additional application method has been added with the use of a Dosatron[®] metering system.

Composition and associated physical properties of factory emulsified 3-D Microemulsion are as follows:

Density: is approximately 1 g/cc (8.34 lbs/gallon) at 20°C/68°F Physical Form: liquid, composed of 2 part water to 3 parts Factory Emulsified 3-D Microemulsion (2:3)

The 3-D Microemulsion factory emulsion can be diluted water a (v/v) volume to volume basis to produce the desired diluted concentration. Most typical concentrations range from 1 to 10% (v:v); more dilute concentrations can be easily produced using the water volumes provided in the table below.

Higher dilution rates are governed by the following technical considerations:

- Factory emulsified 3-D Microemulsion required to treat the estimated contaminant mass
- Target pore volume in which the Factory Emulsified 3-D Microemulsion is applied
- Available application time (aquifer acceptance rate)



REGENESIS 3-D Microemulsion[®] Factory Emulsified Factory Emulsified, pH Neutral, Staged Release, Electron Donor Emulsion

PRODUCT APPLICATION INSTRUCTIONS

Although using a more dilute microemulsion will produce a greater volume of the material, it will also lower the delivered concentration. Thus, the benefit of using a higher dilution rate (to affect a greater pore volume of the subsurface aquifer) is offset by the lower factory emulsified 3-D Microemulsion concentration. Another important consideration is the aquifer's capacity to accept the volume of material (i.e., the aquifer's hydraulic conductivity and effective/mobile porosity).

It is important that the user consider the 3-D Microemulsion factory emulsion dilution rate to be employed at a project site. The resulting emulsion volume will dictate the site water requirements and the time required for injection, etc. If the subsurface does not readily accept the volume as designed, the user can simply reduce the amount of water, thereby lowering the volume of subsequent batches. For more information on design and material dilution rates to meet specific site conditions, please contact Regenesis Technical Services.

3-D Microemulsion Factory Emulsified (%)	3-D Microemulsion Factory Emulsified (mg/L)	3-D Microemulsion Factory Emulsified (gal)	Clear Water (gal)	Resulting Volume (gal)
10	100,000	1	9	10
5	50,000	1	19	20
3	30,000	1	32	33
2	20,000	1	49	50
1	10,000	1	99	100

The following table provides a quick reference to the dilution water necessary for some common application rates:

EXAMPLE: Create a 50,000 mg/L factory emulsified 3-D Microemulsion material

• Dilute each gallon of material with 19 gallons of water resulting in a 20 gallon material volume

3-D Microemulsion[®] Factory Emulsified Dilution

There are two basic approaches for dilution of factory emulsified 3-D Microemulsion. These approaches are referred to as "on demand" and "batched" and are discussed below:



REGENESIS 3-D Microemulsion[®] Factory Emulsified

Factory Emulsified, pH Neutral, Staged Release, Electron Donor Emulsion

PRODUCT APPLICATION INSTRUCTIONS

On Demand – Dosatron[®] Metering System

This method consists of the dilution and application of factory emulsified 3-D Microemulsion in "real time". This is typically accomplished at the well head and is used almost exclusively via dedicated injection well applications. These systems are designed to dilute the material "in-line" and on an "as needed" basis. The most common metering system used for this purpose is the Dosatron[®] System. This is a volume-based metering system that is positioned at the surface and on individual well heads. These units create a targeted dilution of factory emulsified 3-D Microemulsion in water by metering a set volume of the material into a set volume of clear water passing through and powering the device. Thus, fluctuations in the water flow volume or pressure will not result in a change in the rate of factory emulsified 3-D Microemulsion delivered. This device will maintain consistent water to emulsion ratio regardless of water flow rate or pressure.

NOTE: prior to use, each drum or tote of factory emulsified 3-D Microemulsion should be stirred thoroughly using a paint mixer equipped drill.

In this method, each delivery point is manifold to a central clear water holding tank via a manifold system as shown below. Typically, a single pump is placed between the holding tank and the manifold, this pump is used to pressurize the system and to maintain the flow of clear water through the manifold and to the individual application points. A flow meter/totalizer, pressure gauge and ball check valve should be present between the manifold effluent and each Dosatron unit to allow the applier to regulate and monitor individual application rates. This will aid in determining each application point's optimal acceptance rate. Please refer to the User's Manual for your Dosatron. Additional information and specific set up information is available on the Dosatron[®] Website at http://www.dosatronusa.com/search-results.aspx?QueryExpr=manuals .



PRODUCT APPLICATION INSTRUCTIONS



Dilution of the Factory Emulsified 3-D Microemulsion[®] in a Batched Configuration

Batched

This method consists of preparing a pre-determined volume of dilute factory emulsified 3-D Microemulsion and storing it in a batch tank until applied. Delivery of the dilute microemulsion can be to a single delivery point (or well) or multiple delivery points via a manifold system, in either case the injection location must be plumbed to the factory emulsified 3-D Microemulsion holding tank and account for the issues outlined in the Application Methods introduction (below). The delivery of dilute microemulsion is typically via wells or direct push injection points that are connected to the central diluted microemulsion tank via a manifold system and include a dedicated inline flow meter/totalizer, pressure gauge and ball valve for each well or injection point. Often a single pump is placed between the dilute microemulsion tank and the manifold, this pump is used to pressurize the system and maintain flow of the dilute factory emulsified 3-D Microemulsion through the manifold and application points. The flow meter/totalizer and pressure gauge allow the applier to monitor application rates and back pressure for each well or injection point and thus the aquifer's acceptance rate. A simple manifold system with pressure gauges and flow meter/totalizer is shown below. NOTE: upon dilution the material should be stirred on a periodic and regular basis (as shown above).



REGENESIS 3-D Microemulsion[®] Factory Emulsified

Factory Emulsified, pH Neutral, Staged Release, Electron Donor Emulsion

PRODUCT APPLICATION INSTRUCTIONS

Factory Emulsified 3-D Microemulsion[®] Application

The application of the dilute factory emulsified 3-D Microemulsion is typically accomplished by injection via direct-push points (DPI) or dedicated injection wells. Regardless of which delivery option is used, dilution of the factory emulsion prior to application is most appropriate. Application can be performed using pressure or gravity feed.

At a minimum the applier should use the following instrumentation to monitor application:

- Pressure gauges
 - psi range should be selected based site specific conditions
 - aquifer conductivity (anticipated aquifer acceptance rate)
 - pump type (e.g. double diaphragm vs. positive displacement pumps)
 - application methods [Direct Push Injection vs. Injection Wells]
 - not-to-exceed pressures
- In-Line Flow Meters
 - o range should be selected based on site specific requirements
- Pressure-Relief Valves for prevention of pressure buildup in various segments of the application tooling
 - o positioning of pressure relief valves should be considered in the following locations
 - At or along product delivery lines or manifold
 - The injection well head or direct push injection rod → product delivery hose connection

For direct assistance or more information contact us at 1-949-366-8000 or send an e-mail to tech@regenesis.com



3-D Microemulsion[®] Factory Emulsified MATERIALS SAFETY DATA SHEET

Last Revised: November 15, 2011

	Section 1 – Material Identification
Supplier:	
REGENI 1011 Calle Somb	ESIS ra A 02673
San Ciemente, C	A 92075 040 344 8000
Phone:	949.300.8000
Fax:	
E-mail:	info@regenesis.com
Chemical Name(Glycerides, tall-oil di-, mono [2-[2-[2-(2-hydroxy-1-oxopropoxy)-1- oxopropoxyl]-1-oxopropoxy]propanoates]
Chemical Family	: Organic Chemical
Trade Name:	3-D Microemulsion [®] Factory Emulsified
Synonyms:	HRC Advanced [®] , HRC-PED (Hydrogen Release Compound – Partitioning Electron Donor)
Product Use:	Used to remediate contaminated groundwater (environmental applications)
	Section 2 – Chemical Identification
CAS#	Chemical
823190-10-9	HRC-PED
72-17-3	Sodium Lactate
7789-20-0	Water

Melting Point:	Not Available (NA)
Boiling Point:	100 °C
Flash Point:	>93.3 °C using the Closed Cup method
Density:	1.0 -1.2 g/cc
Solubility:	Soluble in water.
Appearance:	White emulsion.
Odor:	Not detectable
Vapor Pressure:	None
	Section 4 – Fire and Explosion Hazard Data
Extinguishing Media:	Use water spray, carbon dioxide, dry chemical powder or appropriate foam to extinguish fires.

Section 3 – Physical Data

Water May be used to keep exposed containers cool.

For large quantities involved in a fire, one should wear full protective clothing and a NIOSH approved self contained breathing apparatus with full face piece operated in the pressure demand or positive pressure mode as for a situation where lack of oxygen and excess heat are present.

	Section 5 – Toxicological Information
Acute Effects:	May be harmful by inhalation, ingestion, or skin absorption. May cause irritation.
Sodium Lactate:	Toxicity to Animals: LD50: Not available. LC50: Not available. Chronic Effects on Humans: Not Available. Other Toxic Effects on Humans: Very hazardous in case of skin contact (irritant), ingestion and inhalation.
Soybean Oil:	Health Hazards (Acute and Chronic): Acute: none observed by inhalation. Chronic: none reported.
Inhalation Risks and Symptoms of Exposure:	Excessive inhalation of oil mist may affect the respiratory system. Oil mist is classified as a nuisance particulate by ACGIH.

Skin Absorption Health Risks and Symptoms of Exposure:

Sensitive individuals may experience dermatitis after long exposure of oil on skin.

Section 6 – Health Hazard Data

Handling:	Avoid continued contact with skin. Avoid contact with eyes.
In any case of any human immediately.	exposure which elicits a reaction, a physician should be consulted
First Aid Procedures:	
Inhalation:	Remove to fresh air. If not breathing give artificial respiration. In case of labored breathing give oxygen. Call a physician.
Ingestion:	No effects expected. Do not give anything to an unconscious person. Call a physician immediately. DO NOT induce vomiting.
Eye Contact:	Wash eyes with plenty of water for at least 15 minutes lifting both upper and lower lids. Call a physician.

	Section 7 – Reactivity Data
Conditions to Avoid:	Strong oxidizing agents, bases and acids
Hazardous Polymerization:	Will not occur.
Stability:	Spontaneous combustion can occur.
Further Information:	Hydrolyses in water to form lactic acid and soybean oil.
Hazardous Decomposition Products:	ⁿ None known.

	Section 8 – Spill, Leak or Accident Procedures
After Spillage or Leakage:	Neutralization is not required. The material is very slippery. Spills should be covered with an inert absorbent and then be placed in a container. Wash area thoroughly with water. Repeat these steps if slip hazard remains.
Disposal:	Laws and regulations for disposal vary widely by locality. Observe all applicable regulations and laws. This material may be disposed of in solid waste. Material is readily degradable and hydrolyses in several hours.

No requirement for a reportable quantity (CERCLA) of a spill is known.

Section 9 – Special Protection or Handling

Should be stored in plastic lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass containers.

Protective Gloves:	Vinyl or Rubber
Eyes:	Splash Goggles or Full Face Shield. Area should have approved means of washing eyes.
Ventilation:	General exhaust.
Storage:	Store in cool, dry, ventilated area. Protect from incompatible materials.

Section 10 – Other Information

This material will degrade in the environment by hydrolysis to lactic acid and soybean oil. Materials containing reactive chemicals should be used only by personnel with appropriate chemical training.

This material is a non hazardous material in regards to USDOT shipping criteria.

The information contained in this document is the best available to the supplier as of the time of writing. Some possible hazards have been determined by analogy to similar classes of material. No separate tests have been performed on the toxicity of this material. The items in this document are subject to change and clarification as more information becomes available.

APPENDIX D

WELL CONSTRUCTION LOGS



CONSULI GEOLOG	H&A OF NEW YORK FING GEOTECHNICAL ENGINBERS BISTS AND HYDROGEOLOGISTS	OVERBURDEN GROUNDWATER MONITOR	ING WELL REPORT
PROJECT: 500 LOCATION: SPEN CLIENT: RITE CONTRACTOR: NOTE DRILLER: K. E INSTALLATION DATE:	UNION STREET NCERPORT, NEW YORK 5 AID HNAGLE DRILLING BUSCH RIG TYPE: 11/13/98	FILE NO.: 7062 WELL NO.: MW-1 LOCATION: SEE BK-81 SHEET: 1 OF INSPECTOR: N. H	0-019 03 PLAN 1 0Y
Survey Datum		Depth/Stickup above/below ground surface of protective casing.	Plush
Ground Elevation:		Depth/Stickup above/below ground surface of riser pipe. Thickness of Surface Seal	0.5 ft. 3.3 ft.
U M A R	- CEMENT GROUT -	Type of Surface Seal [indicated all seals showing depth, thickness and type]	See Left
In Zo Et	3.3 ft.	Type of Protective Casing Inside Diameter of Protective Casing	Roadbox 8.0 in.
st Do I		Depth of Bottom of Protective Casing	<u> </u>
L 8 C 2 C 1	-HYDRATED BENTONITE PELLETS -	Type of Backfill Around Riser	
	6.2 ft.	Type of coupling (threaded, welded, etc.)	Threaded
D 4 3	00N QUARTZ SAND	Type of Wallscreen	7.0 ft
		Screen Slot Size	10_Slot
		Type of Backfill Around Wellscreen	00N Quartz Sau 17.0 ft.
	17.0 ft.	Depth of Bottom of Borehole	17.0 £t.
			· the
Remarks: 3 Bags san * Water level at 12	d; 15-gallon bucket benton: .2 ft. @ 15:00, 11/12/98	te pellets, 1-80 lb. bag Portland Cement	
VIII			Well No. MW-103

H&. Ci	A OF NEW onsultin Geologí	YORK, ROCHE Ig Geotechnic sts and Hydr	STER, NEW : al Enginee: ogeologist:	YORK rs, s		TEST BORING REPORT	BORING NO. B103
PROJECT CLIENT: CONTRAC	: SP RI FOR: NO	PENCERPORT - TE-AID THNAGLE DRIL	500 UNION : LING	STREET			FILE NO. 70620-019 SHEET NO. 1 OF 1 LOCATION: See Plan
	ITEM		CASING	DRIVE SAMPLER	CORE	DRILLING EQUIPMENT & PRO	CEDURES
TYPE INSIDE I HAMMER (HAMMER)	DIAMETER WEIGHT FALL	(IN) (LB) (IN)	AUGERS 4-1/4	SS 1-3/8 140 30		RIG TYPE: BK-61 BIT TYPE: AUGERS DRILL MUD: OTHER:	DATUM: START: 11/12/98 FINISH: 11/12/98 DRILLER: K. Busch H&A REP: N. Hoy
DEPTH (FT)	MICRO TIP (PPM)	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (PT)	STRATA CHANGE (FT)	VISUAL CLASS	IFICATION AND REMARKS
	1				0.5	ASPHALT.	
	- ND	5	S1 11"/18"	0.5		Dark brown sandy SILT, tra	ce coarse sand, damp.
·····	ND	7 7 7	S2	2.0	5	Brown SILT, trace clay and	coarse to fine sand, damp.
	ND	10 12 5 7		4.0		Same with fine sand lens f	rom 5.6 to 5.8 ft.
		8 9	18"/24"	6.0			
••••• <u></u> •	ND	9 14 11	54 22"/24"	6.0 8.0		Same .	
~ ~	-	14	\$5	8.0		Same, wet 8.5 ft. and 9.6	ft.
	ND	17	20"/24"	10.0			
							IACUSIKINE-
						Same.	
		10 16	SG	13.0		Same.	
		32 30	24"/24"	15.0			
		14	57	15.0		Same.	
		29	22 724	17.0		Pad of Pro	clay.
	ND					and of any.	toración at 17.0 ft.
						Notes:	
20	<u>ът</u> ъ					1. All samples screened w	ith a microtip.
	NL)					2. 2.0 in. Monitoring well borehole. See MW-103 W	L was installed in completed Well Installation Report.
		WATER LEVEL	DATA			SAMPLE IDENTIFICATION	SUMMARY
DATE	TME	ELABORD	DEPTH (FT) TO:				OVERBURDEN (LIN FT): 17.0
SALD	▲ 그 야 타	TIME (HR)	BOTTOM OF CASING	BOTTOM OF HOLE	WATER	T Thin Wall Tube U Undisturbed Sample	ROCK CORED (LIN FT):
						S Split Spoon	SAMPLES: 78
							BORING NO. B-103

Januari Andrea Andrea Januari Andrea Andrea Januari Andrea Andrea

H& C	A OF NEW onsultin Geologi	YORK, ROCHE g Geotechnic sts and Hydro	STER, NEW al Enginee ogeologist	YORK rs, s		TEST BORING REPORT	BORING NO. B106	;
PROJECT CLIENT: CONTRAC	: SP RI FOR: NO	ENCERPORT - TE-AID THNAGLE DRIL	500 UNION : LING	STREET			FILE NO. 7062 SHEET NO. 1 OF LOCATION: See	0-019 ' 1 Plan
	ITEM		CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PRO	CEDURES ELEVATION: 606	.1
TYPE INSIDE HAMMER HAMMER	DIAMETER VEIGHT FALL	(IN) (LB) (IN)	AUGERS 4-1/4 	SS 1-3/8 140 30		RIG TYPE: BK-81 BIT TYPE: AUGERS DRILL MUD: OTHER:	DATUM: START: 11/13 FINISH: 11/13 DRILLER: K. BUS HGA REP: N. Hoy	/98 /98 ch
DEPTH (FT)	MICRO TIP (PPM)	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (PT)	VISUAL CLASS	IFICATION AND REMARKS	
		32	S1.	0.0	0.2	Gray gravel (crushed ston	e), dryFILL-	
	- ND	32 18 19	5"/24"	2.0]	Brown SILT, trace clay, tr	ace sand and coarse sand, dry	·.
		28	\$2	2.0		Same.		
		32 37	14"/24"	4.0		Brown silty fine SAND, tra	ce coarse sand, damp.	
5		10 20	\$3	4.0		-LA Same, except less silt, mo	jet. Topikine-	
		20	19"/24"	6.0				
		8	S4	6.0		Same. Brown SILT, trace clay and	fine sand, coarse sand. damn	
		17 24	24"/24"	8.0			, Louis, and	
		5 25	S5	8.0		Same, except wet.		
-10		29	20"/24"	10.0				
·····								
_		5	96	13 0		67mg		
		8 13	24"/24"	15.0				
-15	ND	18	S7	15.0		Same.		
		12 15	24 " / 24 "	1,7.0	ļ			
		15				End of Exp.	loration at 17.0 ft.	
_					:	Notec		
-20						1. All samples screened w	th microtin	
						2. A 2.0 in. monitoring we borehole. See well com	all was installed in complete apletion report for MW-106.	ł
			1					
- 25								
		WATER LEVEL	DATA			SAMDLE IDENTITION	C1 7 374 R A 3 7 7 7 7	
			DEPT	H (FT) TO:		SUMMARY SUMMARY		0
ATE	TIME	ELAPSED TIME (HR)	BOTTOM OF CASING	BOTTOM OF HOLF	WATER	O Open End Rod T Thin Wall Tube U Undisturbed Sample	ROCK CORED (LIN FT):	4
					······	S Split Spoon	SAMPLES: S7	
							BORING NO. B-1	06

	H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINE: GEOLOGISTS AND HYDROGEOLOGIST:	IRS ;	OVERBURDEN GROUNDWATER MONITORING	WELL REPORT
PROJECT: LOCATION: CLIENT: CONTRACTOR	500 UNION STREET SPENCERPORT, NEW YORK RITE AID : NOTHNAGLE DRILLING		FILE NO.: 70620-01 WELL NO.: MW-106 LOCATION: SEE PLAN	9
DRILLER: INSTALLATI	K. BUSCH RIG TY DN DATE: 11/13/98	E: BK-81	SHEET: 1 OF 1 INSPECTOR: N. HOY	
Survey Datum		Dept suz	h/Stickup above/below ground face of protective casing.	Flu
Ground Elevation:		Depth sur	/Stickup above/below ground face of riser pipe.	0.5
S		- Thick	ness of Surface Seal	
U M M A	- CEMENT GROUT -	[indi	of Surface Seal cated all seals showing depth, kness and type]	<u></u>
In Zo		Туре	of Protective Casing	Roa
Et	3.0 ft	Insid	e Diameter of Protective Casing	B.C
S L 0 0		Depth	of Bottom of Protective Casing	12.0
I Ls	-HYDRATED	Insid	e Diameter of Riser Pipe	2.0
C a .	PELLETS -	Type Diame	of Backfill Around Riser	<u>See</u>
N e D	5.5 ft.			
T		Type	of coupling (threaded, welded, etc.) _	Thre
о N	001	Depth	of Bottom of Riser	7.0
5	QUARTZ SAND	Scree	n Slot Size	10 S
		Diame	ter of Wellscreen	2.0
		Туре	of Backfill Around Wellscreen	OON Quar
		Depth	of Bottom of Wellscreen	
	17.0 £t.	Depth	of Bottom of Borehole	. 17.
Remarks:				

Borehole Number: MW-1D



Project: 500 South Union St RI/AAR

Client: Eyezon Associates, Inc.

A.K.A.:

Site Location: 500 South union Street, Spencerport, NY

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716) 856-0635

SUBSURFACE PROFILE SAMPLE PID Well Completion SPT N-Value Details (Ħ VOCs Lab Description Sample No. Elev. Depth Sample or Recovery (ASTM D2488: Visual-Manual Procedure) /Depth Remarks (fbgs) Symbol ppm 12.5 25 Ground Surface 0.0 0.0 Sandy Silt with Fill Concret 0.0 Black/grey, moist, mostly non-plastic fines with some -1.5 1.5 fine sand, trace coarse sand and fine gravel, with Protective Ca S1 NA 2.7 cinders. 0.0 Lean Clay Reddish brown, moist, mostly low plasticity fines, with -4.0 4.0 few fine sand, trace fine gravel, medium dense, wet 0.0 2" PVC Riser fine sand lense at (3.5 fbgs). 5.0 As above, no wet lense. S2 NA 4.0 fbgs 0.0 MW-1D (6 - 8 fbqs) -8.0 8.0 As above. 0.0 g, 10.0 S3 NA 2.9 0.0 Bentonite chips -11.0 11.0 Sandy Silt <u>-12.0</u> 12.0 Reddish brown, wet, mostly non-plastic fines, some fine sand, dense, low dilatancy, 0.0 As above, medium dense, rapid dilatancy. -14.0 14.0 NA S4 2.9 Lean Clay 0.0 Reddish brown, wet, mostly medium plastic fines, with 15.0 few fine sand, dense, massive.. -<u>16.0</u> 16.0 As above, wet. 0.0 -18.0 18.0 S5 NA 2.7 As above, wet. 0.0 (25.0 - 20.0 fbgs) 2" PVC Screen, 0.010" slot--20.0 20.0 20.0 As above, grading to grey. 00 S6 NA 2.7 ο ο Sand Silica -24.0 24.0 Sandy Lean Clay 0.0 NOO 25.0 Grey, moist, mostly non to low plasticity fines, some NA 1.0 S7 fine sand, few fine gravel (angular). S8 NA Bedrock Bentonite chips Grey, wet, angular dolostone fragments moderate strength. End of Borehole 30.0

Drilled By: Nothnagle Drilling Drill Rig Type: CME 550 Drill Method: HSA 4 1/4-inch with 4-foot macrocore Comments: Drill Date(s): 8/30/10 Hole Size: 8 1/2- inch Stick-up: Flush Mount Datum: Site Datum of 100 fmsl

Borehole Number: MW-2D



Project: 500 South Union St RI/AAR

Client: Eyezon Associates, Inc.

A.K.A.:

Site Location: 500 South Union Street, Spencerport, NY

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716) 856-0635

		SUBSURFACE PROFILE	5	SAM	PLE				
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs 0 12.5 25	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							
_	-1.0 1.0	Sandy Silt with Fill Black/grey, moist, mostly non-plastic fines with some fine sand, few coarse sand and fine gravel, trace cinders, (0.0 - 0.7 fbgs old asphalt) and sub-base, medium dense.	S1	NA	2.4		0.0 0.0		► Concrete
5.0 —	4.0	with fine sand (wet at 3.5 - 4.0), trace fine gravel, medium dense, low dry strengh. Lean Clay Reddish brown, moist, mostly low plasticity fines, few fine sand, trace coarse sand, medium dense, medium	S2	NA	3.3		0.0		2" PVC Riser
	-8.0	toughness.							
	8.0	Sandy Silt Reddish brown,moist to wet (12 fbgs), mostly non plastic fines, with, few fine sand,trace fine gravel dense.	S3	NA	3.3		0.2		st water 12.0 fbgs
	<u>-12.0</u> 12.0	As above.	S4	NA	3.5		1.2	MW-2D (12.0-14.0)	0.010" slot
15.0	40.0								en, (
-	-18.0 16.0 -19.0 19.0 -20.0	<i>Lean Clay</i> Reddish brown, wet, mostly low plasticity fines, few fine sand, fine sand lenses, (18 - 18.5 fbgs 1/2 - inch thick). As above, grey.	S5	NA	3.9		1.0 7.3		0-12.0 fbgs) 2" PVC Scre
20.0	-22.6	As sbove reddish brown, with grey dolostone rock chips, suspected top of rock at 22.60 fbgs.	S6	NA	0.4		0.4		▼ (22)
-	22.6	End of Borehole							sqirtc
 25.0									Bentonite c

Drilled By: Nothnagle Drilling, Inc. Drill Rig Type: CME 550 Drill Method: HSA 4 1/4-inch with 4-foot macrocore Comments: Drill Date(s): 9/2/10 Hole Size: 8 1/2- inch Stick-up: Flush Mount Datum: Site datum of 100 fmsl

Site Location: 500 South union Street, Spencerport, NY

Borehole Number: MW-3

A.K.A.:



Project: 500 South Union St RI/AAR

Client: Eyezon Associates, Inc.

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716) 856-0635

SUBSURFACE PROFILE SAMPLE Well Completion PID SPT N-Value Details ŧ VOCs Lab Description Sample No. Depth Elev. Recovery Sample or (ASTM D2488: Visual-Manual Procedure) /Depth Symbol Remarks (fbgs) ppm 12.5 25 Ground Surface 0.0 0.0 Sandy Silt with Gravel and Fill Concrete 1.2 Black/grey, moist, mostly non-plastic fines with some fine sand, few coarse sand and fine gravel, trace -1.5 1.5 cinders, roots in upper 2-inch, (0.8 - 1.3 fbgs), old ¥ asphalt and sub-base. NA S1 3.4 Sandy Silt 0.0 Reddish Brown, moist, mostly non - plastic fines, some Bentonite chips fine sand, trace fine coarse sand, dense. -4.0 4.0 As above, trace fine gravel. **PVC Riser** .4 5.0 S2 NA 4.0 0.7 -8.0 8.0 As above, wet fine sand lenses (below 10 fbgs). 1.0 10.0 NA 4.0 S3 0.2 **JON Silica Sand** slot First water (15.0 fbgs) -12.0 12.0 As above, wet (15 fbgs), trace coarse gravel, rapid (19.2 - 9.7 fbgs) 2" PVC Screen, 0.010" dilatancy, low plasticity lense (15.0 fbgs). 0.0 MW-3 (12-14)S4 NA 4.0 0.0 15.0 <u>-16.0</u> 16.0 Sandy Lean Clay with Gravel. 0.0 Grey, moist, mostly non to low plasticity fines, with some fine sand, with little coarse gravel, dense, refusal at 19.7 fbgs (suspected top of rock). NA 0.8 S5 0.0 -19.7 19.7 End of Borehole Bentonite chips 20.0

Drilled By: Nathnagle Drilling Drill Rig Type: CME 550 Drill Method: HSA 4 1/4-inch with 4-foot macroecore Comments: Drill Date(s): 9/1/10 Hole Size: 8 1/2- inch Stick-up: Flush Mount Datum: Site Datum of 100 fmsl

Borehole Number: MW-4D



Project: 500 South Union St RI/AAR

Client: Eyezon Associates, Inc.

A.K.A.:

Site Location: 500 South Union Street, Spencerport, NY

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716) 856-0635

SUBSURFACE PROFILE SAMPLE PID Well Completion SPT N-Value Details ŧ VOCs Lab Description Sample No. Elev. Depth Recovery Sample or (ASTM D2488: Visual-Manual Procedure) /Depth Remarks (fbgs) Symbol ppm 12.5 25 Ground Surface 0.0 0.0 Concrete Sandy Silt with Fill 0.0 -1.0 1.0 Black/grey, moist, mostly non-plastic fines with some fine sand, few coarse sand and fine gravel, trace S1 NA 3.2 cinders. 00 Lean Clay -4.0 4.0 Reddish brown moist, mostly low plasticity fines, with few fine sand, trace fine gravel, dense, medium 0.0 2" PVC Riser 5.0 toughness. As above, trace fine gravel S2 NA 3.6 0.0 -8.0 8.0 0.0 Bentonite chips As above, wet (11.5 fbgs), sand sand lenses, starting 📕 First water 10.0 NA 3.3 at 10 fbgs. S3 0.0 -12.0 12.0 Silty Sand 0.0 Reddish brown, wet, mostly fine sand, little non-plastic fines, trace coarse gravel, rapid dilatancy, low plasticity S4 NA 2.8 lense (15.0 fbgs) 2.6 15.0 -16.0 16.0 As above, trace coarse sand, no coarse gravel. 2.9 ₹ S5 NA 3.2 (27.5-17.5 fbgs) 2" PVC Screen, 0.010" slot -20.0 20.0 Lean Clay Sand 23 As above. Silica -22.0 22.0 S6 NA 4.0 Sandv Silt 5.9 NOC Reddish brown, wet, mostly non-plastic fines, some MW-4D (22-24) fine sand, rapid dilatancy. 0.0 25.0 S7 NA 2.9 0.0 -27.0 27.0 Lean Clay with Sand ¥ -28.0 28.0 Grey, wet, mostly low plasticity fines, with little fine Bentonite Chips sand, trace fine gravel, very stiff, refusal at 28.0 fbgs (suspected top of bedrock). 30.0 End of Borehole

Drilled By: Nathnagle Drilling, Inc. Drill Rig Type: CME Drill Method: HSA 4 1/4-inch with 4-foot macroecore Comments: Drill Date(s): 8/31/10 Hole Size: 8 1/2- inch Stick-up: Flush Mount Datum: Site Datum 100 fmsl

D1-300 Borehole

Project No: 0188-001-300

Borehole Number: MW-5D

Project: 500 South Union St RI/AAR

Client: Eyezon Associates, Inc.

A.K.A.:



TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716) 856-0635

Site Location: 500 South union Street, Spencerport NY

Logged By: TAB

Checked By: BCH

		SUBSURFACE PROFILE	S	SAM	PLE				
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs 0 12.5 25	Lab Sample	Well Completion Details or Remarks
0.0-	0.0	Ground Surface							
-	0.0	Fill Black/grey, moist, mostly non-plastic fines with some fine sand, few coarse sand and fine gravel, trace cinders.	S1	NA	4.0				►Concrete
 5.0	-4.0 4.0	Lean Clay Reddish Brown, moist, mostly low-plasticity fines, with few fine sand, trace fine gravel, stiff.				7			C Riser
_	-8.0	As above, wet (7.5 fbgs).	S2	na	4.0			MW-5D (6-8)	2" PVC
- 10.0 —	8.0	As above.	S3	26 30	2.6				antonite chips -
-	<u>-12.0</u> 12.0	As above, trace coarse gravel.	S4	22 39	1.6				ď
13.0	-16.0								
-	-20.0	Sandy Lean Clay Reddish Brown, wet, mostly low plastic fines, with some fine sand, trace fine gravel, medium dense, fine sand lense at (18.5 fbgs).	S5	16 34	3.8				
20.0	-24.0	Sandy Silt Reddish brown, wet, mostly non-plastic fines, with some fine sand, medium dense, rapid dilatancy.	S6	17 25	0.3				n, 0.010° slot 🖌
25.0 — _ _	-28.0	As above, grey low plasticity lenses (26.0 to 28.0 fbgs).	S7	18 15	2.7				fbgs) 2" PVC Scree
30.0 -	-31.3	Sandy Lean Clay As (16.0 - 20.0), suspected Bedrock (31.3 fbgs).	S8	100 6	2.4				▲ (30.8 - 20.8
- - 35.0	31.3	End of Borehole							Bentonite chips.

Drilled By: Nathnagle Drilling Drill Rig Type: CME Drill Method: HSa 4 1/4-inch with 4-foot macroecore Comments: Drill Date(s): 8/31/10 Hole Size: 8 3/4- inch Stick-up: Flush Mount Datum: Site datum of 100 fmsl

Sheet: Broke teeth at 6.3 fbgs, (4).

Project No: 0136-007-100 Borehole Number: SB -			- 5/	ΡZ	- 5			TURN	KEY		
Pr	oject: Sp	encerport							RESTORATIO	DN. LLC	
CI	<i>ient:</i> Ellic	cott Development	Logged	d By:	TAB			TurnKey Ei 726 Ei	nvironmen kchange S	tal Rest treet, S	toration, LLC uite 624
Si	te Locati	on: Spencerport NY	Checke	ed By	/:				Buffal (716) 85	o, NY 6-0635	
		SUBSURFACE PROFILE	Ś	SAN	IPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	0	PID VOCs 25 5	Lab Sample	Well	Completion Details or Remarks
0.0 —	104.6 0.0	Ground Surface ASPHALT					•				
-	103.6 1.0	Asphalt and base material. CLAYEY SILT Reddish brown, moist, Clayey Silt with some fine to coarse sand and trace fine gravel, massive, very stiff	S1	NA	2.5						
5.0 —	<u>98.6</u> 6.0	CLAYEY SILT SAA but wet.	S2	NA	2.4					ite seal (medium chips)	C riser.
			\$3	NA	3.4					Bentor	Sch. 40 PV
			S4	NA	2.6					ind pack (#00n)	een (10.0 to 15.0 fbgs).
-	86.6		S%	NA	2.6				TCL + STARS 8260	S.	h. 40 PVC 0.010 slot scr
	18.0	End of Borehole									Sci
20.0-											

Drilled By: Trec Environmental, Inc. Drill Rig Type: Geoprope Drill Method: Direct push with 4 foot macro - core

Drill Date(s): 3/19/08 - 3/20/08

Hole Size: 2" Stick-up: flush - mount Datum: site datum of 100 fmsl

Borehole Number: PZ-8

BINIRONMENTAL RESTORATION, LLC

Project: 500 South Union St RI/AAR

Client: Eyezon Associates, Inc.

A.K.A.:

Site Location: 500 South Union Street, Spencerport, NY

Logged By: TAB

Checked By: BCH

TurnKey Environmental Restoration, LLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218 (716) 856-0635

		SUBSURFACE PROFILE	S	SAM	PLE				
Depth (ftbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs 0 50 100	Lab Sample	Well Completion Details or Remarks
0.0	0.0	Ground Surface							srete-
-	-0.5 0.5	Concrete floor. Silt with Sand Brown maint, month, son plantic finan, with little finan	S1	NA	1.2		0.0		iser]-Con
-	-2.0 2.0	sand, trace fine gravel, dense.				<u> </u>			
-		As above, few fine sub-rounded gravel.	S2	NA	1.5		0.0		1" P
-	-4.0 4.0	As above.							
5.0 —	-5.5 5.5	Lean Clav	S3	NA	1.3		30.3		
-		Reddish brown, moist, mostly low medium plasticity fines, with few fine sand, stiff.	S4	NA	1.7	/	58.8	PZ-8 (6-8)	1" PVC Screer
-	-8.0 8.0					4	<mark></mark>		ogs) .
-	-10.0	As above wet.	S5	NA	0.7		2.8		(12.0-2.0 ft
10.0	10.0	As above wet to moist.							
-	-12.0		S6	NA	1.1		5.3		Sand
-	12.0	As above.	S7	NA	0.3		-9-/		Silica
-		End of Borehole							S N00
15.0 —									
-									
_									
-									
20.0 -							L		

Drilled By: Trec Environmental, Inc. Drill Rig Type: Geoprobe 480 Drill Method: Direct push, 2-foot macro-core Comments: Drill Date(s): 8/31/10 Hole Size: 3- inch Stick-up: Flush Mount Datum: Site Datum of 100 fmsl

APPENDIX E

SITE INSPECTION AND FIELD FORMS



Date	Time	Inspector's Initials	Fan System -1 (in.WC)	Fan System -2 (in.WC)	Fan System -3 (in.WC)	Fan System -4 (in.WC)

500 South Union Street Site (C828153) ASD System Inspection Log

Notes:

Date	



ЭC	DATE		
ורא רי	NO.		
DA	SHEET	OF	

FIELD ACTIVITY DAILY LOG

PROJECT NAME:	PROJECT NO.			
PROJECT LOCATION:	CLIENT:			
FIELD ACTIVITY:				
DESCRIPTION OF DAILY ACTIVITIES AND EVEN	NTS:			
TIME	DESCRIPTION			
	CHANGES FROM PLANS AND SPECIFICATIONS AND			
	OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:			
WEATHER CONDITIONS:	Notes:			
A.M.:				
PM:				
1 .171				
PERSONNEL ON SITE:	•			
PERSONNEL ON SITE:				

Field Activity Daily Log (FADL).xls



Site Inspection Form

Property Name:	Project No.:	
Client:		
Property Address:	City, State:	Zip Code:
Preparer's Name:	Date/Time:	

Final Surface Cover / Vegetation

In accordance with the Soil/Fill Management Plan, the integrity of the vegetative soil cover or other surface coverage (e.g., asphalt, concrete) over the entire Site must be maintained. The following documents the condition of the above.

1.	Final Cover is in Place and in good condition? Cover consists of (mainly):	🗌 yes	no	□ N/A	
2.	Evidence of erosion?	🗌 yes	🗌 no	□ N/A	
3.	Cracks visible in pavement?	□ ^y es	□ ^{no}	□ ^{N/A}	
4.	Evidence of distressed vegetation/turf?	U yes	no no	□ N/A	
5.	Evidence of unintended traffic and/or rutting?	🗌 yes	🗌 no	□ N/A	
6.	Evidence of uneven settlement and/or ponding?	🗌 yes	🗌 no	□ N/A	
7.	Damage to any surface coverage?	🗌 yes	🗌 no	□ N/A	

If yes to any question above, please provide more information below.

Property Use Changes / Site Development			
Has the property usage changed, or site been redevelor	ped since the last inspec	tion?	
	🗌 yes	no	□ N/A
If so, please list with date:			
New Information			
Has any new information been brought to the owner/inspection engineering and institutional controls and their operation	pector's attention regardi and effectiveness?	ng any and/o	or all
	🗌 yes	no	□ N/A
Comments:			
Notes and Comments			



Corrective Action Certification Operation, Monitoring, & Maintenance Plan

Property Name:		Project No.:	
Client:			
Property Address:		City, State:	Zip Code:
Property ID: (Tax Assessment Map)	Section:	Block:	Lot(s):
Preparer's Name:	Date/Time:		

Issue Addressed

The Environmental Inspection of the above property determined the need for corrective action. This form has been completed to document the required corrective action and it's implementation.

Description of Site Issue identified during Environmental Inspection (include sketch & photographs):

Corrective Action Taken

Date Completed:

Describe Action Taken (include sketch & photographs):

Certification of Implementation

The signatory hereby certifies that the corrective action as described in this form has been completed in accordance with all relevant requirements of the Soil/Fill Management Plan and other applicable documents.

Date:

Signature:

Please verify inclusion of the following Attachments:

- 1. Site Sketch
- 2. Photographs

New York State Department of Environmental Conservation

Division of Environmental Remediation, 11th Floor

625 Broadway, Albany, New York 12233-7011 **Phone:** (518) 402-9553 **Fax:** (518) 402-9577 **Website:** www.dec.ny.gov

45-Day Reminder Notice: Site Management Periodic Review

September 29, 2009 Site Name: Site No.: Site Address:

, NY

Dear :

This is a reminder that as part of the last phase of a site's remedial program (i.e., "Site Management" (SM)), a progress report for your site is to be submitted by you, the site owner or Remedial Party, to the New York State Department of Environmental Conservation (Department) by . This report, now referred to as the Periodic Review Report (PRR) documents the implementation of and compliance with the Site Management requirements for this site. SM is a concept defined in regulation (6 NYCRR 375-1.2(at)). A suggested outline for the PRR is enclosed. If the site is comprised of multiple properties or parcels, then you as the owner or Remedial Party must arrange to submit one PRR for all parcels that comprise the site.

Depending on the age of the remedial program for your site, the document(s) governing SM for your site will be different. Previously, SM requirements were contained in separate documents with specific titles (e.g., Operation, Maintenance, and Monitoring Plan or Soil Management Plan) and are now being incorporated into one comprehensive "Site Management Plan" (SMP). A SMP may contain one or all of the following elements as applicable to the site; a plan to maintain institutional and/or engineering controls ("IC/EC Plan"), a plan for monitoring the performance and effectiveness of the selected remedy ("Monitoring Plan"), and/or a plan for the operation and maintenance of the selected remedy ("O&M Plan"). Additionally, the requirements for SM are normally stated in the decision document (e.g., Record of Decision) and/or the legal agreement directing the remediation of the site (e.g., order on consent, voluntary agreement, etc.).

When you submit the PRR (by the due date above), please sign and include the enclosed forms documenting that all SM requirements are being met. If there is some reason you cannot certify that all SM requirements are being met, you should indicate this and include a statement of explanation in the PRR with a schedule for addressing the problem(s). The Periodic Review process will not be considered complete until all necessary corrective measures are completed and any required controls are certified. Instructions for completing the certifications are enclosed.

Enclosures

ec: , Project Manager , Bureau Director Hazardous Waste Remediation Engineer, Region Gary Litwin, DOH

cc:
Enclosure Periodic Review Report (PRR) General Guidance

I. Introduction: (½-page or less)

- A. Provide a brief summary of site, nature and extent of contamination, and remedial history.
- B. Effectiveness of the Remedial Program Provide overall conclusions regarding;
 - 1. progress made during the reporting period toward meeting the remedial objectives for the site
 - 2. the ultimate ability of the remedial program to achieve the remedial objectives for the site.

C. Compliance

1.

- Identify any areas of non-compliance regarding the major elements of the Site Management Plan (SMP, i.e., the Institutional/Engineering Control (IC/EC) Plan, the Monitoring Plan, and the Operation & Maintenance (O&M) Plan).
- 2. Propose steps to be taken and a schedule to correct any areas of non-compliance.
- D. Recommendations
 - 1. recommend whether any changes to the SMP are needed
 - 2. recommend any changes to the frequency for submittal of PRRs (increase, decrease)
 - 3. recommend whether the requirements for discontinuing site management have been met.

II. Site Overview (one page or less)

- A. Describe the site location, boundaries (figure), significant features, surrounding area, and the nature and extent of contamination prior to site remediation.
- B. Describe the chronology of the main features of the remedial program for the site, the components of the selected remedy, cleanup goals, site closure criteria, and any significant changes to the selected remedy and site that have been made since remedy selection.

III. Evaluate Remedy Performance, Effectiveness, and Protectiveness

A. Using tables, graphs, charts and bulleted text to the extent practicable, describe the effectiveness of the remedy in achieving the remedial goals for the site. Base findings, recommendations, and conclusions on objective data. Evaluations should be presented simply and concisely.

IV. IC/EC Plan Compliance Report (if applicable)

A. IC/EC Requirements and Compliance

- 1. Describe each control, its objective, and how performance of the control is evaluated.
- 2. Summarize the status of each goal (whether it is fully in place and its effectiveness).
- 3. Corrective Measures: describe steps proposed to address any deficiencies in ICECs.
- 4. Conclusions and recommendations for changes.
- B. IC/EC Certification
 - 1. The certification must be complete (even if there are IC/EC deficiencies), and certified by the appropriate party as set forth in a Department-approved certification form(s).

V. Monitoring Plan Compliance Report (if applicable)

- A. Components of the Monitoring Plan (tabular presentations preferred) Describe the requirements of the monitoring plan by media (i.e., soil, groundwater, sediment, etc.) and by any remedial technologies being used at the site.
- B. Summary of Monitoring Completed During Reporting Period Describe the monitoring tasks actually completed during this PRR reporting period. Tables and/or figures should be used to show all data.
- C. Comparisons with Remedial Objectives Compare the results of all monitoring with the remedial objectives for the site. Include trend analyses where possible.
- D. Monitoring Deficiencies Describe any ways in which monitoring did not fully comply with the monitoring plan.
- E. Conclusions and Recommendations for Changes Provide overall conclusions regarding the monitoring completed and the resulting evaluations regarding remedial effectiveness.

VI. Operation & Maintenance (O&M) Plan Compliance Report (if applicable)

- A. Components of O&M Plan Describe the requirements of the O&M plan including required activities, frequencies, recordkeeping, etc.
- B. Summary of O&M Completed During Reporting Period Describe the O&M tasks actually completed during this PRR reporting period.
- C. Evaluation of Remedial Systems Based upon the results of the O&M activities completed, evaluated the ability of each component of the remedy subject to O&M requirements to perform as designed/expected.
- D. O&M Deficiencies Identify any deficiencies in complying with the O&M plan during this PRR reporting period.
- E. Conclusions and Recommendations for Improvements Provide an overall conclusion regarding O&M for the site and identify problems, their severity, and any suggested improvements requiring changes in the O&M Plan.

VII. Overall PRR Conclusions and Recommendations

- A. Compliance with SMP For each component of the SMP (i.e., IC/EC, monitoring, O&M), summarize;
 - 1. whether all requirements of each plan were met during the reporting period
 - 2. any requirements not met such as new completed exposure pathways resulting in unacceptable risk
 - 3. proposed plans and a schedule for coming into full compliance.
- B. Performance and Effectiveness of the Remedy Based upon your evaluation of the components of the SMP, form conclusions about the performance of each component and the ability of the remedy to achieve the remedial objectives for the site.
- C. Future PRR Submittals
 - 1. Recommend, with supporting justification, whether the frequency of the submittal of PRRs should be changed (either increased or decreased).
 - 2. If the requirements for site closure have been achieved, contact the Department's Project Manager for the site to determine what, if any, additional documentation is needed to support a decision to discontinue site management.

VIII. Additional Guidance

A. Additional guidance regarding the preparation and submittal of an acceptable PRR can be obtained from the Department's Project Manager for the site.

WHERE to mail the signed Certification Form by :

New York State Department of Environmental Conservation

Attn:, Project Manager

Please note that extra postage may be required.



Enclosure 1 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION Site Management Periodic Review Report Notice Institutional and Engineering Controls Certification Form



Site	e No.	x 1	
Site	e Name		
Site City Cot Allo Site Ow	e Address: Zip Code: //Town: unty: wwable Use(s) (if applicable, does not address local zoning): e Acreage: ner: 		
		Во	ox 2
	Verification of Site Details	YES	NO
1.	Is the information in Box 1 correct?		
	If NO, are changes handwritten above or included on a separate sheet?		
2.	Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period?		
	If YES, is documentation or evidence that documentation has been previously submitted included with this certification?		
3.	Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period?		
	If YES, is documentation (or evidence that documentation has been previously submitted) included with this certification?		
4.	If use of the site is restricted, is the current use of the site consistent with those restrictions?		
	If NO, is an explanation included with this certification?		
5.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-141 has any new information revealed that assumptions made in the Qualitative Exposu Assessment regarding offsite contamination are no longer valid?	5.7(c), re □	
	If YES, is the new information or evidence that new information has been previously submitted included with this Certification?	,	
6.	For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-141 are the assumptions in the Qualitative Exposure Assessment still valid (must be certified every five years)?	5.7(c), □	
	If NO, are changes in the assessment included with this certification?		

SITE NO.

Box 3

Description of Institutional Controls

Box 4

Description of Engineering Controls

			Box 5
	Periodic Review Report (PRR) Certification Statements		
1.	I certify by checking "YES" below that:		
	 a) the Periodic Review report and all attachments were prepared under the direct reviewed by, the party making the certification; 	ction of,	and
b) to the best of my knowledge and belief, the work and conclusions described in t are in accordance with the requirements of the site remedial program, and generall		n this ce rally acc	ertification epted
Ì	engineering practices, and the information presented is accurate and compete.	YES	NO
 If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all o following statements are true: 		each In t all of t	astitutional he
	(a) the Institutional Control and/or Engineering Control(s) employed at this site in the date that the Control was put in-place, or was last approved by the Departme	s uncha ent;	nged since
	(b) nothing has occurred that would impair the ability of such Control, to protect the environment;	public h	ealth and
	 (c) access to the site will continue to be provided to the Department, to evaluate including access to evaluate the continued maintenance of this Control; 	e the ren	nedy,
	(d) nothing has occurred that would constitute a violation or failure to comply with Management Plan for this Control; and	th the S	ite
	(e) if a financial assurance mechanism is required by the oversight document for mechanism remains valid and sufficient for its intended purpose established in the mechanism remains valid and sufficient for its intended purpose established in the	or the sit he docu	e, the ment.
		YES	NO
3.	If this site has an Operation and Maintenance (O&M) Plan (or equivalent as required in Document);	n the De	ecision
	I certify by checking "YES" below that the O&M Plan Requirements (or equivalent as req	luired in	the
	becision becamency are being met.	YES	NO
4.	If this site has a Monitoring Plan (or equivalent as required in the remedy selection do	cument)	;
l	I certify by checking "YES" below that the requirements of the Monitoring Plan (or equivaling the Decision Document) is being met.	alent as	required
		YES	NO

IC CERTIFICATIONS SITE NO.			
	Box 6		
SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE I certify that all information and statements in Boxes 2 and/or 3 are true. I understand that statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210 Penal Law.	a false 0.45 of the		
Iatatatatat			
print name print business address			
am certifying as(Owner or Re	medial Party)		
for the Site named in the Site Details Section of this form.			
Signature of Owner or Remedial Party Rendering Certification Date			
 IC/EC CERTIFICATIONS			
Box 7 QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE I certify that all information in Boxes 4 and 5 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.			
print name print business address	,		
am certifying as a Qualified Environmental Professional for the	·		
(Owner or Remedial Party) for the Site named in the Site Details Section of this form.			
Signature of Qualified Environmental Professional, for Stamp (if Required) Date the Owner or Remedial Party, Rendering Certification)		

Enclosure 2

Certification Instructions

I. Verification of Site Details (Box 1 and Box 2):

Answer the six questions in the Verification of Site Details Section. Questions 5 and 6 only refer to sites in the Brownfield Cleanup Program. The Owner and/or Qualified Environmental Professional (QEP) may include handwritten changes and/or other supporting documentation, as necessary.

II. Certification of Institutional / Engineering Controls (Boxes 3, 4, and 5)

- 1. Review the listed IC/ECs, confirming that all existing controls are listed, and that all existing controls are still applicable. If there is a control that is no longer applicable the Owner / Remedial Party is to petition the Department requesting approval to remove the control.
- 2. In Box 5, complete certifications for all Plan components, as applicable, by checking the corresponding checkbox.
- 3. If you cannot certify "YES" for each Control and/or certify the other SM Plan components that are applicable, continue to complete the remainder of this **Certification** form. Attach supporting documentation that explains why the **Certification** cannot be rendered, as well as a statement of proposed corrective measures, and an associated schedule for completing the corrective measures. Note that this **Certification** form must be submitted even if an IC or EC cannot be certified; however, the certification process will not be considered complete until corrective action is completed.

If the Department concurs with the explanation, the proposed corrective measures, and the proposed schedule, a letter authorizing the implementation of those corrective measures will be issued by the Department's Project Manager. Once the corrective measures are complete, a new Periodic Review Report (with IC/EC Certification) is to be submitted within 45 days to the Department. If the Department has any questions or concerns regarding the PRR and/or completion of the IC/EC Certification, the Project Manager will contact you.

III. IC/EC Certification by Signature (Box 6 and Box 7):

If you certified "YES" for each Control, please complete and sign the IC/EC Certifications page. Where the only control is an Institutional Control on the use of the property the certification statement in Box 6 shall be completed and may be made by the property owner. Where the site has Institutional <u>and</u> Engineering Controls, the certification statement in Box 7 must be completed by a Professional Engineer or Qualified Environmental Professional (see table below).

Table 1. Signature Requirements for Control Certification Page			
Type of Control	Example of IC/EC	Required Signatures	
EC which does not include a treatment system or engineered caps.	Fence, Clean Soil Cover, Individual House Water Treatment System, Vapor Mitigation System	A site or property owner or remedial party, and a QEP. (P.E. license not required)	
EC that includes treatment system or an engineered cap.	Pump & Treat System providing hydraulic control of a plume, Part 360 Cap.	A site or property owner or remedial party, and a QEP with a P.E. license.	

APPENDIX F

GROUNDWATER SAMPLER PRODUCT INFORMATION





PASSIVE DIFFUSION SAMPLING INSTRUCTIONS

Contact your local ALS Technical Sales Representative for more information.

Contains certified ASTM Type II deionized water

Thank you for your recent Passive Diffusion Bag (PDB) order. Following you will find instructions for storage, deploying and retrieving of your PDB. Please read through the following carefully prior to opening your package.

PDB Storage

- ALS Environmental recommends storing the PDB in their shipping pouch in a dry location (between 50 - 75°F) until deployment if you will be deploying them within 14 days of receiving them.
- If you will be storing them for over 14 days before deployment, we recommend that they be stored in a foil pouch (available from ALS Environmental) to avert any possible diffusion from the storage ambient air.

For an instructional video on how to deploy and retrieve your PDB, visit our website and search PDBs.

PDB Deployment

- 1. Deploy the PDB as soon as possible upon removal from the shipping/storage pouch.
- 2. The long seams of the PDB are designed to resist wear and tearing, however, the construction of some wells may lead to excessive stress on the PDB. To avoid any possible tearing under these circumstances (rock boreholes, pore or uncertain well construction), we recommend placing the PDB in a mesh cover. (These are available through ALS Environmental.)
- 3. The PDB should be attached to your hanging line at a depth ensuring they hang at the desired location in the well screen.
- 4. If using a hanging assembly supplied by ALS Environmental, secure the line to the plastic disk or well cap before lowering the PDB and assembly into the well.
- 5. Lower the weight into the well first, followed by the line and PDB.
- 6. Secure the line to the well head.
- 7. Secure the well.

Continued on reverse side...



Scan the QR code or visit WWW.ALSGLOBAL.COM







PDB Retrieval

- 1. Field experience has shown that using a plastic winder or a spool winder to retrieve the PDB allows the sampler to keep the line from tangling and makes deployment of the new PDB easier.
- 2. If a single individual is retrieving the PDB, it is helpful to have a 2-4 foot long PVC pipe that has been cut in half length-wise. The field sampler can lay the PDB in the pipe after retrieval prior to sample replacement into the VOA vials. A PVC pipe may be procured from any building or hardware supplier.
- 3. The contents of the PDB should be poured into the VOA vials at the well head. Studies have shown that there is loss of volatile organics from the PDB within 30 minutes after retrieval. Using decontaminated scissors, cut off the angled end of the PDB, then pour the contents of the PDB carefully into the VOA vials, taking care to avoid splashing or unnecessary mixing of air into the sample.
- 4. Fill each vial just to overflowing and maintain a reverse meniscus. Cap the vial, making sure there are no bubbles or headspace.
- 5. Dispose of the remnants of the PDB and any unused sample appropriately.
- 6. Deploy a new PDB for your next sampling round.

Unfilled PDB Sampler Instructions

The only difference in the procedures for deployment of pre-filled and unfilled PDB concerns testing of the water used to fill the PDB. A sample of the water used and rinseate of the equipment used to fill the PDB, if any, should be submitted to the laboratory for testing to verify it does not contain any of the analytes of interest.

All PDBs

If trip blanks/equipment blanks are required, an extra PDB should be ordered. This extra PDB should be sampled into VOA vials or appropriate containers and sent to the laboratory for testing to ensure that no contamination took place during the deployment process.

ORDER YOUR SUPPLIES: http://tiny.cc/alspassive









PASSIVE DIFFUSION BAGS (PDBs)

Contact your local ALS Technical Sales Representative for more information.

ALS Environmental manufactures high-quality passive diffusion samplers for the collection of groundwater samples for the analysis of volatile organics.

PDBs are polyethylene tubes or bags filled with analyte-free water. Hung in monitoring wells for periods of 14 days, or until equilibrium is complete between the contaminants in the bag and the surrounding groundwater, the PDB operates by diffusion of contaminates across the polyethylene membrane. No purging is necessary.

Developed originally by GE and the USGS, the widely used PDBs have been installed successfully for over ten years at hundreds of monitoring sites. Data from the bag samples is considered as valid as that obtained from other conventional sampling procedures.

The PDB is a rugged device made from medical grade, high strength low density polyethylene. Patented tubes with special heat sealed seams that resist abrasion, unique tabs that allow both quick attachment to hanging assemblies, and ease in pouring upon retrieval have made the PDB the diffusion sampler of choice. Engineers and scientists converting to passive sampling for their groundwater monitoring have installed over 100,000 of our samplers.

Laboratory-like quality control criteria are utilized in the manufacture of the PDB. The analyte-free water is identical to that used in our organics laboratories and certificates of quality (to 0.01 ppb) are provided with each shipment. Medical grade polyethylene is unique to the PDB, providing both additional strength and assurance of contaminant-free material. Strength drop tests are applied to each lot of PDBs.

Simplicity in the design of the PDB extends to its utility and cost effectiveness in the field. No additional parts are required! Storage space is minimal, handling is easy, deployments and retrievals are fast, and sampling into vials is simple.

Stainless steel non-corrosive hanging assemblies are available where long term repetitive monitoring justifies the capital investment. Otherwise, the PDBs can be hung from any sturdy lines of the client's choice. Also, when long storage periods are anticipated, e.g. when large lot sizes are purchased or sampling delays are possible, ALS Environmental makes available pouches made of diffusion resistant mylar.

ORDER YOUR SUPPLIES: http://tiny.cc/alspassive



Continued on reverse side... **Scan the QR code or visit** WWW.ALSGLOBAL.COM





PDB Options Available

The standard size PDB sampler is 24" long and 1 ¼" in diameter. It is manufactured from 4 Mil-thick, 2" wide, "lay flat", low-density polyethylene. All seams and connections are made by heat-seals only. The pre-filled PDB sampler holds approximately 220 mL of certified, laboratory-grade, analyte-free, deionized water. After retrieval, simply cut the top and pour water into 40 mL vials.

Different sizes are available with advance notice. If there is a chance of abrasion or tearing due to the well's physical condition, we recommend the use of a protective polyethylene mesh cover.

The unfilled PDB sampler must be filled with water prior to deployment. It is fitted at one end with a threaded screw cap for filling and a snap-on spout for pouring water into vials. When ready to sample, just open the snap top and pour.

PDB Manufacturing

ALS Environmental has been granted a license to manufacture, use and provide the bags by the US Geological Survey (USGS) and The General Electric Company (GE), both co-patent holders on the product (US #5,804,743). The downhole passive water sampler and method of sampling was invented by Don Vroblesky (USGS) and Thomas Hyde (GE).

ALS Environmental is a leader in passive diffusion sampler technology and has been since March 2000 when it began manufacturing and distributing samplers for Volatile Organic Compounds (VOCs). Wide acceptance of these samplers has spurred ALS Environmental to partner with USGS to develop passive diffusion samplers for common LTM inorganic parameters. Both laboratory and field demonstration studies are ongoing for the use of rigid porous polyethylene (RPP) samplers for various analytes.

Pricing for PDBs

PDBs, each	Pre-Filled Price	Unfilled Price
1-50 (standard 24" length, 220ML)	\$28.50	\$20.00
51 or more (standard 24" length, 220ML)	\$25.00	\$19.00
36" Length - 1-1/4" Diameter, 330MML	\$28.50	N/A
36″ Length - 3/4″ Diameter, 75ML	\$28.50	N/A
48" Length - 3/4" Diameter, 120ML	\$28.50	N/A
Other non-standard size bags are available	Call for quote	Call for quote

Pricing for PDB Accessories

Storage Pouches, each	Ргісе
zip-lock type (storage < 14 days before deployment)	Free with purchase
foil barrier type (storage > 14 days before deployment)	\$15.00
Protective Mesh Cover, each	Price
One unit (optional and reusable)	\$2.00
Hanging Assemblies and Supplies, each	Price
Hanging assembly (custom sized to order) (reusable)	Call for quote
Weights 8 oz. (5/8" diameter x 7" long)	\$16.00

ORDER YOUR SUPPLIES: http://tiny.cc/alspassive

All orders are carefully packaged to ensure a safe delivery of your order. Orders are generally shipped 2nd-Day Air and may either be billed normally or to your own shipping account. Expedited shipping options are available.



Scan the QR code or visit WWW.ALSGLOBAL.COM





RIGID POROUS POLYETHYLENE (RPP) SAMPLERS

Contact carlton.beechler@alsglobal.com for more information.

Contains certified ASTM Type II deionized water

Thank you for your recent RPP order. Following, you will find instructions for storing, deploying and retrieving of your RPP. Please read through the following carefully prior to opening your package.

RPP Storage

• Do not remove RPP from shipping pouch until you are ready to place down the well. RPPs are made of porous polyethylene. Shipping pouch should be free of air bubbles upon receipt.

RPP Deployment

- 1. Deploy the RPP as soon as possible upon removal from the shipping/storage pouch.
- 2. When ready to attach RPP to the hanging line at the well, hold the sampler in a vertical position with the red cap end up. Cut away the pouch, and keeping the same vertical orientation, attach the sampler to the line with cable ties. The white plug end should be facing down.
- 3. Lower the line with the sampler attached into the well as steadily and smoothly as possible, taking care to not use any sudden motions. The sampler could leak some of its' contents if it hits against the sides of the well or is not smoothly and gently lowered into the well.

RPP Retrieval

- 1. Pull the line up steadily without sudden motions.
- 2. When the sampler appears, cut the cable ties to the hanging line, keeping the sampler in the same vertical position with the white plug facing down.
- 3. Cut the cable ties from the mesh at the top and bottom still keeping the same vertical orientation.
- 4. Pushing on the red cap, press the sampler through the mesh until the white plug is just free of the mesh. Again, keep the same vertical orientation. The white plug end should be down.
- 5. As soon as possible, pour the contents in to the appropriate sample bottle. This is done by inverting the sampler (white plug end up), turning the plug out of the pipe, and immediately pouring the contents into the sample bottle.



Scan the QR code or visit WWW.ALSGLOBAL.COM







OROUS POLYETHYLENE AMPLERS

Contact carlton.beechler@alsglobal.com for more information.

According to the Interstate Technical Regulatory Council's (ITRC) Passive Diffusion Team, passive sampling of groundwater refers to collecting a representative sample of the aquifer immediately adjacent to a specific position in a well without active media transport induced by pumping or purging techniques.

Passive sampling significantly reduces the field costs and time associated with groundwater well monitoring, reduces field sampling variability, can provide vertical profiling of contaminate concentrations, and has no known depth limit. Passive samplers are easy to deploy and retrieve and may be used in conjunction with one another.

ALS Environmental manufactures the RPP Samplers which may be used to collect samples for inorganic constituents and water-soluble organic compounds.

RPPs were invented by Don Vroblesky, Ph.D., of the United States Geological Survey (USGS). ALS Environmental manufactures a prototype that will soon be licensed with the USGS for production under the US Patent Application Serial #10/767,496, entitled "Porous Polyethylene Diffusion Sampler for Groundwater."

RPPs are made of thin sheets of foam-like porous polyethylene with pore sizes of 6-20 microns. When completely filled with water the pores allow a water-water interface, facilitating the equilibrium of water-soluble analytes in the aquifer adjacent to the well screen with the deionized water of the RPP. Like the majority of passive samplers, it is recommended that they remain deployed for a minimum of 14 days, though the analytes of interest may equilibrate sooner.

The RPPs are deployed with the plug end down and are kept in this position until the contents are placed into sample bottles for transport to the laboratory. This is to avoid leakage from the pores of the sampler.

Primary Applications

- Long-term groundwater monitoring situations, especially when purged water must be collected and disposed of off-site. 1.
- Well fields in porous/permeable formations with good groundwater recovery. 2.
- All water soluble analytes, like inorganic anions and cations, metals, MEE parameters, 1,4-dioxane, MTBE, hexavalent chromium, 3. explosives, perchlorate and dissolved gases.
- Very useful in deep wells where submersible pumps may not function. 4.



RPP Pricing

RPP, each	Price
RPP Sampler (6″ length, 1.5″ diameter, 100ML)	\$65.00
Hanging Assemblies and Supplies, each	Price
Hanging assembly (custom sized to order)	Call for quote; reusable
Weights, 8 oz. (5/8" diameter x 7" long)	\$16.00; reusable

Please allow one week for RPP delivery.

RPP Benefits

- Samples all water soluble analytes, such as:
 - Perchlorate
- Metals
- 1,4-dioxane Inorganic anions and cations
- MEE parameters
- anions MTBĖ
- Hexavalent chromium
 Explosives
 - Dissolved gases



The RPP is 5-6 inches long and 2 mm thick, capped at one end and a Delrin® plug at the other. Each RPP holds approximately 110 mL of certified, laboratory grade deionized water. They come in a protective mesh cover that allows attachment to the deployment line with simple cable ties. They are prepackaged in a heat-sealed polyethylene sleeve filled with certified, laboratory-grade, analyte-free, deionized water to ensure that the pores of the RPP do not become air-filled thereby blocking the water-water interface and preventing diffusion. The RPPs may be stacked if additional sample volume is desired. Contact ALS Environmental for small volume capabilities.

ALS Environmental is a leader in passive diffusion sampler technology and has been since March 2000 when it began manufacturing and distributing samplers for Volatile Organic Compounds (VOCs). Wide acceptance of these samplers has spurred ALS Environmental to partner with USGS to develop passive diffusion samplers for common LTM inorganic parameters. Both laboratory and field demonstration studies are ongoing for the use of RPPs for various analytes. We actively participate in the ITRC and have been instrumental in technological and regulatory advancements in this field.





APPENDIX G

QUALITY ASSURANCE PROJECT PLAN (QAPP)



SITE MANAGEMENT PLAN APPENDIX F

QUALITY ASSURANCE PROJECT PLAN

500 SOUTH UNION STREET SITE Spencerport, New York BCP Site No. C828153

November 2014

0188-013-001

Prepared for:

Eyezon Associates, Inc.

QUALITY ASSURANCE PROJECT PLAN (QAPP)

500 South Union Street Site

Table of Contents

1.0	Int	RODUCTION	1
	1.1	Site Location and Description	1
	1.2	Site Environmental History	1
	1.3	Scope of the QAPP	3
2.0	Prc	DIECT ORGANIZATION AND RESPONSIBILITY	5
	2.1	NYSDEC and NYSDOH	
	2.2	Property Owner	5
	2.3	Project Manager	5
	2.4	Field Team Leader:	6
	2.5	Quality Assurance (QA) Officer	7
3.0	Q UA	ALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA	
	3.1	Level of QC Effort for Sample Parameters	8
4.0	SAM	IPLE CUSTODY PROCEDURES	10
	4.1	Field Custody Procedures	10
		4.1.1 Sample Storage	10
		4.1.2 Sample Custody	
		4.1.3 Sample Tracking	12
5.0	CAL	IBRATION PROCEDURES AND FREQUENCY	13
	5.1	Field Instrument Calibration	13
	5.2	Preventative Maintenance	13
6.0	DAT	fa Validation and Reporting	14
	6.1	Data Usability Evaluation	14
		6.1.1 Procedures Used to Evaluate Field Data Usability	14
		6.1.2 Procedures Used to Evaluate Laboratory Data Usability	14
	6.2	Data Reporting	15
		6.2.1 Field Data Reporting	
		6.2.2 Laboratory Data Reporting	15
7.0	Сов	RRECTIVE ACTION	16
	7.1	Field Corrective Action	16
	7.2	Laboratory Corrective Action	17
	7.3	Data Validation & Assessment Corrective Action	17



QUALITY ASSURANCE PROJECT PLAN (QAPP) 500 South Union Street Site

Table of Contents

LIST OF TABLES

 Table 1
 Sample Container, Volume, Preservative, and Holding Time Requirements



1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) is an appendix to the Site Management Plan (SMP), which is required as an element of the remedial program at the 500 South Union Street Site (hereinafter referred to as the "Site") under the New York State (NYS) Brownfield Cleanup Program (BCP), administered by New York State Department of Environmental Conservation (NYSDEC). The Site was remediated in accordance with Brownfield Cleanup Agreement (BCA) Index #B8-0790-08-09, which was executed on August 27, 2009.

1.1 Site Location and Description

The 500 South Union Street Site is located in the Village of Spencerport, Monroe County, New York and is identified as Tax ID No. 087.17-1-61, as indicated by the Village of Spencerport tax map. The Site is an approximate 1.2-acre area bounded by South Union Street to the west, Nichols Street to the south, residential condominiums/apartments to the north, and a residential/commercial apartment building to the east. The boundaries of the BCP Site are more fully described in the- Environmental Easement.

1.2 Site Environmental History

The Site was historically used for agricultural purposes through the 1930s. In subsequent decades, a portion of the existing structure was constructed (1940s) and used as a button factory. In the early 1970s, the Site was used commercially as a dry cleaning facility as well as a hair salon and restaurant. During that time, the first addition to the building was completed. In 1989, a second addition was added to the building completing the present day structure.

The dry cleaner ceased using tetrachloroethene in their dry cleaning process in 2000. Prior housekeeping practices at the Site by the dry cleaner operators/owners are suspected to have led to the site contamination.

A Phase I and II Environmental Site Assessment (ESA) was conducted in 1998 as part of a real estate transaction. A second Phase I and II ESA was conducted in April 2008 as part of another real estate transaction. In July 2008, additional subsurface investigation activities were completed to further assess the up and down-gradient groundwater quality at the site. The studies indicated that the soil and groundwater at the site were impacted with tetrachloroethene, trichloroethene, and the associated breakdown products above the State's standards and guidance values. Additional information relative to previous studies completed in connection with the site is provided below.

A Focused Phase I/II Environmental Site Assessment (ESA) Report was completed by Haley & Aldrich of New York (H&A) in November 1998. The Phase I ESA findings identified historic use of the Site as a dry-cleaner since the 1970s and evidence of historic exterior disposal/storage of dry-cleaning machine filters in dumpsters sited east of the building. The Phase II study identified elevated concentrations of chlorinated volatile organic compounds (cVOCs), specifically tetrachloroethene (PCE) and trichloroethene (TCE), which are typically associated with dry cleaning operations within groundwater at each of the monitoring well locations. Soil samples exhibited elevated concentrations of cVOCs and were also slightly impacted by petroleum VOCs (pVOCs) at lower concentrations.

In March 2008, TurnKey performed a Phase I ESA and a Phase II Site Investigation at the Site. The Phase I ESA conclusions were generally consistent with the November 1998 H&A ESA. The Phase II investigation results indicated the presence cVOC analytes attributable to past dry-cleaning operations (i.e., PCE and its chemical breakdown products) in on-site soil and groundwater concentrations that exceeded the Unrestricted Use and Groundwater Protection SCOs, and GWQS, respectively.

TurnKey conducted an Additional Subsurface Investigation at the Site in June 2008. This investigation was performed to further assess up-gradient and down-gradient groundwater quality following the identification of chlorinated-impacts to site groundwater during previous investigations.

An Active Subslab Depressurization (ASD) System IRM Work Plan was prepared by TurnKey and submitted to the NYSDEC for review and approval in August 2010. The ASD IRM Work Plan details the system design and installation, post-installation confirmation testing procedures, and the system operation, maintenance and monitoring.

In September 2010, eight soil vapor samples including a background ambient and QA/QC Blind Duplicate, were collected and analyzed to determine the presence of cVOC vapors on the Site. The subsurface soil vapor sampling points, identified as SV-1 through SV-8, were located around the Site perimeter and, when possible, in close proximity to

known or suspected utility trenches. Following sample collection, the Summa canisters were shipped to an New York State Department of Health (NYSDOH)-approved laboratory for analysis of United States Environmental Protection Agency (USEPA) Target Compound List (TCL) VOCs in accordance with USEPA Method TO-15. Between 2010 and 2012, TurnKey completed the Remedial Investigation (RI) and prepared a Remedial Investigation /Alternatives Analysis Report to more fully characterize the Site in accordance with the BCP requirements. The RI included the advancement of soil borings and installation of monitoring wells and piezometers to assess soil and groundwater at greater depths than previous investigations, collection of surface soil samples, and a soil vapor investigation.

In March 2014, a Remedial Action Work Plan (RAWP) was submitted to the NYSDEC, which included: details of the in-Situ groundwater treatment injection program, post-injection groundwater monitoring, remedial excavation; and placement of cover system in areas without building or hardscape (e.g., asphalt, concrete).

Remedial activities including the IRM and RA were completed by TurnKey between February and November 2014.

1.3 Scope of the QAPP

This QAPP was prepared to provide quality assurance (QA) guidelines to be implemented post-remedial activities. The QAPP will assure the accuracy and precision of data collection during post-remedial Site characterization and data interpretation. The QAPP identifies procedures for sample collection to mitigate the potential for cross-contamination, as well as analytical requirements necessary to allow for independent data validation. The QAPP has been prepared in accordance with USEPA's Requirements for Quality Assurance Project Plans for Environmental Data Operations; the EPA Region II CERCLA Quality Assurance Manual, and NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (May 2010). This document may be modified for subsequent phases of investigative work, as necessary.

The QAPP provides:

• A means to communicate to the persons executing the various activities exactly what is to be done, by whom, and when;





- A culmination to the planning process that ensures that the program includes provisions for obtaining quality data (e.g., suitable methods of field operations);
- A document that can be used by the Project Manager's and QA Officer to assess if the activities planned are being implemented and their importance for accomplishing the goal of quality data;
- A plan to document and track project data and results; and,
- Detailed descriptions of the data documentation materials and procedures, project files, and tabular and graphical reports.

The QAPP is primarily concerned with the quality assurance and quality control aspects of the procedures involved in the collection, preservation, packaging, and transportation of samples; field testing; record keeping; data management; chain-of-custody procedures; laboratory analyses; and other necessary matters to assure that the investigation activities, once completed, will yield data whose integrity can be defended.

QA refers to the conduct of all planned and systematic actions necessary to perform satisfactorily all task-specific activities and to provide information and data confidence as a result of such activities. The QA for task-specific activities includes the development of procedures, auditing, monitoring and surveillance of the performance.

QC refers to the activity performed to determine if the work activities conform to the requirements. This includes activities such as inspections of the work activities in the field (e.g., verification that the items and materials installed conform to applicable codes and design specifications). QA is an overview monitoring of the performance of QC activities through audits rather than first time inspections.



2.0 **PROJECT ORGANIZATION AND RESPONSIBILITY**

The following section provides a generic organization for sampling activities, including roles, responsibilities, and required qualifications of these organizations.

2.1 NYSDEC and NYSDOH

It is the responsibility of the NYSDEC, in conjunction with the New York State Department of Health (NYSDOH), to review the project documents for completeness and conformance with the site-specific cleanup objectives and to make a decision to accept or reject these documents based on this review. The NYSDEC also has the responsibility and authority to review and approve all QA documentation collected during brownfield cleanup construction and to confirm that the QA Plan was followed.

2.2 Property Owner

The property owner (Owner), or holder of the certificate of completion (COC), will be responsible for complying with the QA requirements as specified herein and for monitoring and controlling the quality of the Brownfield cleanup activities either directly or through their designated environmental consultant and/or legal counsel. The Owner will also have the authority to select Contractor(s) to assist them in fulfilling these responsibilities. The Owner is responsible for implementing the project, and has the authority to commit the resources necessary to meet project objectives and requirements.

2.3 Project Manager

The Project Manager has the responsibility for ensuring that the project meets the overall project objectives, reports directly to the Owner, coordinates with the NYSDEC/NYSDOH Project Coordinators, and is responsible for technical and project oversight. The PM will:

- o Define project objectives and develop a detailed work plan schedule.
- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task.





- Acquire and apply technical and corporate resources as needed to assure performance within budget and schedule constraints.
- o Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- o Review the work performed on each task to assure its quality, responsiveness, and timeliness.
- o Review and analyze overall task performance with respect to planned requirements and authorizations.
- o Review and approve all deliverables before their submission to NYSDEC.
- o Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product.
- o Ultimately be responsible for the preparation and quality of interim and final reports.
- o Represent the project team at meetings.

2.4 Field Team Leader:

The Field Team Leader (FTL) has the responsibility for implementation of specific project tasks identified at the Site, and is responsible for the supervision of project field personnel, subconsultants, and subcontractors. The FTL reports directly to the Project Manager. The FTL will:

- o Define daily develop work activities.
- o Orient field staff concerning the project's special considerations.
- o Monitor and direct subcontractor personnel.
- o Review the work performed on each task to ensure its quality, responsiveness, and timeliness.
- o Assure that field activities, including sample collection and handling, are carried out in accordance with this QAPP.

2.5 Quality Assurance (QA) Officer

The QA Officer will have direct access to corporate executive staff as necessary, to resolve any QA dispute, and is responsible for auditing the implementation of the QA program in conformance with the demands of specific investigations and policies, and NYSDEC requirements. Specific function and duties include:

- o Performing QA audits on various phases of the field operations.
- o Reviewing and approving QA plans and procedures.
- o Providing QA technical assistance to project staff.
- o Reporting on the adequacy, status, and effectiveness of the QA program on a regular basis to the Project Manager for technical operations.
- o Responsible for assuring third party data review of all sample results from the analytical laboratory.



3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall objectives and criteria for assuring quality for this effort are discussed below. This QAPP addresses how the acquisition and handling of samples and the review and reporting of data will be documented. The objectives of this QAPP are to address the following:

- The procedures to be used to collect, preserve, package, and transport groundwater samples.
- Field data collection.
- Record keeping.
- Data management.
- Chain-of-custody procedures.
- Precision, accuracy, completeness, representativeness, for sample analysis and data management under EPA analytical methods.

3.1 Level of QC Effort for Sample Parameters

Field blank, method blank, trip blank, field duplicate, laboratory duplicate, laboratory control, standard reference materials (SRM) and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. QC samples are discussed below.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples are analyzed to check for procedural chemical constituents at the facility that may cause sample contamination. Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage.
- Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures.





- Duplicate samples are analyzed to check for sampling and analytical reproducibility.
- MS/MSD and MS/Duplicate samples provide information about the effect of the sample matrix on the digestion and measurement methodology. Depending on site-specific circumstances, one MS/MSD or MS/Duplicate should be collected for every 20 or fewer investigative samples to be analyzed for organic and inorganic chemicals of a given matrix.

The general level of QC effort will be one field (blind) duplicate and one field blank (when non-dedicated equipment is used) for every 20 or fewer investigative samples of a given matrix. Additional sample volume will also be provided to the laboratory to allow one site-specific MS/MSD or MS/Duplicate for every 20 or fewer investigative samples of a given matrix. One trip blank consisting of distilled, deionized water will be included along with each sample delivery group of aqueous VOC samples.



4.0 SAMPLE CUSTODY PROCEDURES

Sample custody is controlled and maintained through the chain-of-custody procedures. Chain of custody is the means by which the possession and handling of samples will be tracked from the source (field) to their final disposition, the laboratory. A sample is considered to be in a person's custody if it is in the person's possession or it is in the person's view after being in his or her possession or it was in that person's possession and that person has locked it in a vehicle or room. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site.

4.1 Field Custody Procedures

Sample custody is controlled and maintained through the chain-of-custody procedures. Chain of custody is the means by which the possession and handling of samples will be tracked from the source (field) to their final disposition, the laboratory. A sample is considered to be in a person's custody if it is in the person's possession or it is in the person's view after being in his or her possession or it was in that person's possession and that person has locked it in a vehicle or room. Sample containers will be cleaned and preserved at the laboratory before shipment to the Site.

4.1.1 Sample Storage

Samples are stored in secure limited-access areas. Walk-in coolers or refrigerators are maintained at 4°C, \pm 2°C, or as required by the applicable regulatory program. The temperatures of all refrigerated storage areas are monitored and recorded a minimum of once per day. Deviations of temperature from the applicable range require corrective action, including moving samples to another storage location if necessary. Sample parameter lists, holding times and sample container requirements are summarized on Table 1.

4.1.2 Sample Custody

Sample custody is defined by this document as when any of the following occur:

- It is in someone's actual possession.
- It is in someone's view after being in his or her physical possession.



- It was in someone's possession and then locked, sealed, or secured in a manner that prevents unsuspected tampering.
- It is placed in a designated and secured area.

Samples are removed from storage areas by the sample custodian or analysts and transported to secure laboratory areas for analysis. Access to the laboratory and sample storage areas is restricted to laboratory personnel and escorted visitors only; all areas of the laboratory are therefore considered secure. If required by the applicable regulatory program, internal chain-of-custody is documented in a log by the person moving the samples between laboratory and storage areas.

Laboratory documentation used to establish COC and sample identification may include the following:

- Field COC forms or other paperwork that arrives with the sample.
- The laboratory COC.
- Sample labels or tags are attached to each sample container.
- Sample custody seals.
- Sample preparation logs (i.e., extraction and digestion information) recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist.
- Sample analysis logs (e.g., metals, GC/MS, etc.) information recorded in hardbound laboratory books that are filled out in legible handwriting, and signed and dated by the chemist.
- Sample storage log (same as the laboratory COC).
- Sample disposition log, which documents sample disposal by a contracted waste disposal company.



4.1.3 Sample Tracking

All samples are maintained in the appropriate coolers prior to and after analysis. The analysts remove and return their samples as needed. Samples that require internal COC are relinquished to the analysts by the sample custodians. The analyst and sample custodian must sign the original COC relinquishing custody of the samples from the sample custodian to the analyst. When the samples are returned, the analyst will sign the original COC returning sample custody to the sample custodian. Sample extracts are relinquished to the instrumentation analysts by the preparatory analysts. Each preparation department tracks internal COC through their logbooks/spreadsheets.

Any change in the sample during the time of custody will be noted on the COC (e.g., sample breakage or depletion).





5.0 CALIBRATION PROCEDURES AND FREQUENCY

This section describes the calibration procedures and the frequency at which these procedures will be performed for both field and laboratory instruments.

5.1 Field Instrument Calibration

Quantitative field data to be obtained during groundwater sampling include pH, turbidity, specific conductance, temperature, dissolved oxygen and depth to groundwater. Quantitative water level measurements will be obtained with an electronic sounder or steel tape, which require no calibration. Quantitative field data to be obtained during soil sampling include screening for the presence of volatile organic constituents using a photoionization detector (PID).

5.2 **Preventative Maintenance**

Each piece of field equipment is checked according to its routine maintenance schedule and before field activities begin. Field equipment that may be used at the Site includes:

- Photoionization detector (PID)
- Water quality meters (includes pH, turbidity, temperature, Eh, and specific conductance)
- Electric water level indicator

Field personnel will report all equipment maintenance and/or replacement needs to the Project QA Officer and will record the information on the daily field record.



6.0 DATA VALIDATION AND REPORTING

All data generated through field activities, or by the laboratory operation shall be reduced and validated (as required in the SMP) before reported.

6.1 Data Usability Evaluation

If requested by the NYSDEC, data evaluation will be performed by a third party data validator using the most current methods and quality control criteria from the USEPA's Contract Laboratory Program (CLP) *National Functional Guidelines for Organic Data Review*, and Contract Laboratory Program, *National Functional Guidelines for Inorganic Data Review*.

6.1.1 Procedures Used to Evaluate Field Data Usability

The performance of all field activities, calibration checks on all field instruments at the beginning of each day of use, manual checks of field calculations, checking for transcription errors and review of field log books is the responsibility of the Field Team Leader.

6.1.2 Procedures Used to Evaluate Laboratory Data Usability

Data evaluation will be performed by the third party data validator using the most current methods and quality control criteria from the USEPA's Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review, and Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review. The data review guidance will be used only to the extent that it is applicable to the SW-846 methods; SW-846 methodologies will be followed primarily and given preference over CLP when differences occur. Also, results of blanks, surrogate spikes, MS/MSDs, and laboratory control samples will be reviewed/evaluated by the data validator. All sample analytical data for each sample matrix shall be evaluated. The third party data validation expert will also evaluate the overall completeness of the data package. Completeness checks will be administered on all data to determine whether deliverables specified in this QAPP are present. The reviewer will determine whether all required items are present and request copies of missing deliverables.

6.2 Data Reporting

6.2.1 Field Data Reporting

All field documents will be accounted for when they are completed. Accountable documents include items such as field notebooks, sample logs, field data records, photographs, data packages, computer disks, and reports.

6.2.2 Laboratory Data Reporting

Analytical data will be summarized in tabular format with such information as sample identification, sample matrix description, parameters analyzed and their corresponding detected concentrations, and the detection limit. Analytical results will be incorporated into reports as data tables, maps showing sampling locations and analytical results, and supporting text.



7.0 CORRECTIVE ACTION

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or out of quality control performance that can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation, and data assessment. All corrective action proposed and implemented should be documented in the regular quality assurance reports to management. Corrective action should be implemented only after approval by the Project Manager, or his/her designee. If immediate corrective action is required, approvals secured by telephone from the Project Manager should be documented in an additional memorandum.

7.1 Field Corrective Action

If errors in field procedures are discovered during the observation or review of field activities by the Project QA Officer or his/her designee, corrective action will be initiated. Nonconformance to the QA/QC requirements of the field operating procedures will be identified by field audits or immediately by project staff who know or suspect that a procedure is not being performed in accordance with the requirements. The Project QA Officer or his designee will be informed immediately upon discovery of all deficiencies. Timely action will be taken if corrective action is necessary.

Corrective action in the field may be needed when the sample network is changed (i.e., more/less samples, sampling locations other than those specified in the Work Plan, etc.) or when sampling procedures and/or field analytical procedures require modification due to unexpected conditions. In general, the Project Manager and QA Officer may identify the need for corrective action. The Project Manager will approve the corrective measure that will be implemented by the field team. It will be the responsibility of the Project Manager to ensure that corrective action has been implemented.

If the corrective action will supplement the existing sampling using existing and approved procedures in the QAPP, corrective action approved by the Project Manager will be documented. If the corrective actions result in less samples (or analytical fractions), alternate locations, etc., which may result in non-achievement of project QA objectives, it will be necessary that all levels of project management, including the NYSDEC Project Coordinator, concur with the proposed action.
Corrective actions will be implemented and documented in the project field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels. If corrective actions are insufficient, work may be stopped by the NYSDEC Project Coordinator.

If at any time a corrective action issue is identified which directly impacts project data quality objectives, the NYSDEC Project Coordinator will be notified immediately.

7.2 Laboratory Corrective Action

Corrective actions may be initiated if the quality assurance goals are not achieved. The initial step in a corrective action is to instruct the analytical laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous result. If no error in laboratory procedures or sample collection and handling procedures can be identified, then the Project Manager will assess whether reanalysis or resampling is required or whether any protocol should be modified for future sampling events.

7.3 Data Validation & Assessment Corrective Action

The need for corrective action may be identified during the data validation or assessment processes. Potential types of corrective action may include resampling by the field team, or reinjection/reanalysis of samples by the laboratory.

These actions are dependent upon the ability to mobilize the field team, whether the data to be collected is necessary to meet the QA objectives (e.g., the holding time for samples is not exceeded, etc.). If the data validator identifies a corrective action situation, the Project Manager will be responsible for approving the corrective action implementation. All required corrective actions will be documented by the laboratory Quality Assurance Coordinator.

TABLES





TABLE 1

SAMPLE CONTAINER, VOLUME, PRESERVATION & HOLDING TIME REQUIREMENTS

QAPP for SMP 500 South Union Street Site Spencerport, New York BCP Site No. C828153

Matrix	Parameter ¹	Method ¹	Container Type	Minimum Volume	Preservation (Cool to 2-4 °C for all samples)	Holding Time from Sample Date
	TCL+CP-51 List VOCs	8260B	WMG	16 oz.	Cool to 4 °C, Zero Headspace	14 days
Soil	TCL SVOCs	8270C	WMG	16 oz.	Cool to 4 °C	14 days extrac./40 days
	TAL Metals	6010B/7471A	WMG	4 oz.	Cool to 4 °C	180 days / Hg 26 days
	Cyanide	9012A	WMG	4 oz.	Cool to 4 °C	14 days
	Pesticides	8081	WMG	8 oz.	Cool to 4 °C	14 days extrac./40 days
	Herbicides	8151	WMG	8 oz.	Cool to 4 °C	14 days extrac./40 days
	PCBs	8082	WMG	4 oz.	Cool to 4 °C	14 days extrac./40 days
	TCL+CP-51 VOCs	8260B	glass vial	3 - 4 oz.	Cool to 4 $^{\circ}$ C, HCl to pH<2,Zero Headspace	14 days
	TCL SVOCs	8270C	amber glass	1000 mL	Cool to 4 °C	7 days extrac/40 days
Groundwater	TAL Metals	6010B/7470A	plastic	250 mL	HNO ₃ to pH<2, Cool to 4 $^{\circ}$ C	180 days / Hg 28 days
	Cyanide	9012A	plastic	250 mL	NaOH to pH>12, Cool to 4 °C	14 days
	PCBs	8082	amber glass	1000 mL	Cool to 4 °C	7 days extrac/40 days
Soil Vapor	TCL VOCs	TO-15	Summa Cannister	6 liters	None	Analyze within 14 days of sample date of collection

References:

1. Test Methods for Evaluating Solid Wastes, USEPA SW-846, Update III, 1991.

Notes:

1. EPA-approved methods published in Reference 1 above may be used. The list of analytes, laboratory method and the method detection limit for each parameter are included in Tables 1 and 2 of the QAPP.

Acronyms:

VOCs = Volatile Organic Compounds SVOCs = Semi-Volatile Organic Compounds TCL = Target Compound List TAL = Target Analyte List WMG = Wide Mouth Glass

APPENDIX H

ACTIVE SUBSLAB DEPRESSURIZATION SYSTEM DOCUMENTS



mitigation tech vapor intrusion specialists

April 7, 2014

Mr. Mike Lesakowski Project Manager TurnKey Environmental Restoration, LLC Benchmark Environmental Engineering & Science, PLLC 2558 Hamburg Turnpike, Suite 300 Buffalo, NY 14218

Re: 500 South Union St, Spencerport, NY 14559 Soil Vapor Intrusion Mitigation System Completion Report

CONSTRUCTION COMPLETION REPORT

1. OVERVIEW

This document presents a construction report, performance evaluation, O&M advice and certification of effectiveness for the Sub-Slab Depressurization (SSD) system installed by *Mitigation Tech* at 500 South Union St, Spencerport, NY, as commissioned March 25, 2014.

The subject area consists of the entire footprint of a free standing commercial use building, currently occupied by six tenants, constructed at different times and with different materials. Based on an analysis of sub-slab air communication data and a general building assessment, a manifolded multi-fan SSD System was installed using principles and equipment typically used for soil vapor intrusion mitigation in buildings. The primary objective of implementing this preemptive measure was to mitigate potential intrusion of vapors related to former manufacturing operations that could migrate into occupied space from beneath the slab. This would be achieved by maintaining a negative pressure of at least .002 water column inches (wci) below the slab relative to the air pressure above the slab. All work is in compliance with the NYS DOH document, "Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006".

April 9, 2014 Page 2 2. BUILDING ASSESSMENT

Preliminary sub-slab air communication testing was performed for a general assessment of the scope of work. The test procedure included drilling core borings into the concrete at likely suction cavity locations, at which vacuum was temporarily applied. Small diameter test holes were established to measure vacuum influence away from core boring locations. Because of relatively high resistance to airflow in the some areas of the sub-slab, limited suction cavity placement opportunities, and the discovery of some open sub-slab areas, it was determined that a combination of high air flow and high vacuum blowers would necessary for comprehensive coverage. Defects in slab integrity that would require sealing were observed.

As an outcome of these and other findings, *Mitigation Tech* proposed and subsequently installed (4) independent SSD systems variously manifolded to (18) suction cavities. Work began with an analysis of appropriate locations for fan, suction cavities and other SSD system components. For minimum impact on active use areas, riser pipes were strategically and with occupant consultation and horizontal pipe was installed near the ceiling. Work was coordinated with tenenats to minimize disturbance of work schedules and control dust. Vacuum testing was performed continuously during construction determine the most efficient system configuration and verify integrity of design. At commissioning, all components inspected for condition and proper operation.

3. SUB-SLAB DEPRESSURIZATION SYSTEM GENERAL DESCRIPTION

3.1. Introduction. The system consists of 4 independent SSD systems operating independently at strategic locations throughout the site, as itemized below. Each individual system consists of a sidewall mounted fan and several extraction points. The system was constructed using principles and equipment typically used for radon mitigation in buildings as detailed in the United States Environmental Protection Agency (EPA) EPA 402-K-03-007 (May 2006), and the final NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). The SSD system was installed as a permanent, integral addition to the structure. The key components of the SSD system are described below and are shown on the attached diagram titled "Sub-Slab Depressurization System".

3.2. Suction Points. The location of each suction point (vapor extraction point) is given in the attachment to this document titled "Sub-slab Depressurization System" which shows a site diagram. The suction point consists of a 5" core boring into the slab through which 1-2 cubic feet of sub-slab material has been removed. Mechanically suspended Schedule 40 3" PVC pipe has been inserted into the boring and sealed with urethane sealant. There are a total of 18 suction cavities.

3.3. Riser Piping. The riser piping consists of 3" schedule 40 PVC pipe that follows a route from the extraction point to a manifold then to an exterior mounted vacuum fan, through a sidewall penetration. Weatherproof flashing or sealant has been applied to all penetrations. Vent pipes were installed at a pitch that ensures that any rainwater or condensation within the pipes drains downward into the ground beneath the slab. Piping is independently supported, and not supported from existing building mechanical systems. Piping is labeled at each level as "Sub-Slab Vent". Risers are protected either by the columns in which they are installed or by strategic placement.

3.4. Exhaust Fans. Exhaust fans consist of RADONAWAY RP-265 centrifugal fans (Fan Systems 1,2,3) and RADONAWAY GP-501 centrifugal fan (Fan System 4),. The RADONAWAY GP-501 consumes approximately 150w of electricity and produces a static pressure differential of up to 4.0 water column inch (wci). The RP-265 consumes approximately 140w of electricity and produces a static pressure differential of up to 2.4 wci. The GP-501 and RP-265 are 120V. Fans have an exterior disconnect switch connected to a dedicated circuit. Circuits are switched at the electrical panel located in the owner office area. Fans are mounted with rubber Fernco couplings, for simplified replacement.

FAN INFORMATION

April 9, Page 3	, 2014				
Name	Location	Area Covered	Type Vac	uum (3/03/14)	# Suc pts.
F1	W (north)	2 N tenants	RP265	1.3 wci	6
F2	Rear Ent	Cleaners Pontillos	RP265	0.9 wci	4
F3	Rear Ent	Cleaners S Restaurant	RP265	1.3 wci	4
F4	Rear Ent	Caterer	GP501	1.8 wci	4

3.5. Instrumentation and Control. There is no centralized instrumentation or control for the SSD System. Individual fans can be switched either from the sidewall positioned disconnect or at the breaker. A Photohelic pressure switch with an amber warning beacon is located in the hallway to signal system failure. Each exhaust fan system is equipped with a vacuum indicator mounted in a visible location. The indicator consists of an oil filled U-tube style manometer . The indicator is inspected by observing the level of colored fluid. This indicator is designed primarily to give a simple visual check that vacuum is present in the riser pipe, specifically by observation that the fluid levels on each side of the indicator are not even. Indicators are marked at levels observed on March 25, 2014.

3.7. Sealing measures. Polyurethane sealants and mechanical barriers have been applied to floor cracks, slab penetrations and other openings to enhance the barriers between sub-slab and ambient air and improve the efficiency of the SSD System. Sealant has been applied also in the vicinity of suction points and at cracks in concrete bases of columns. Smoke testing has been employed to guide sealing operations.

3.6. Monitoring Points. There are 11 sub-slab vacuum test points located throughout the building. These consist of $\frac{3}{4}$ " drill points through the slab into which a digital micromanometer probe can be inserted. They are semipermanently closed with closed cell backer rod and polyurethane sealant. These were established to aid in original system design and confirmatory testing, and in some cases are difficult to access. The primary future use would be in recertification of system effectiveness.

3.7. PERFORMANCE EVALUATION

(Measurement date – March 25, 2014 - In order to verify system effectiveness and as a performance evaluation, test points were established at various distances from the suction cavities suitable to determine that the sub-slab of the entire subject area was being depressurized at least to the objective, as shown in the following table: (locations per schematic)

Test Point	Vacuum in negative wci
1	.145
2	.004
3	.008
4	.030
5	.023
6	.006
7	.013
8	.022
9	.014
10	.035
11	.037

4. SUB-SLAB DEPRESSURIZATION SYSTEM OPERATION

April 9, 2014 Page 4

4.1. All fans should be kept in continuous operation. New York State Soil Vapor Intrusion Guidance (2006) specifies that operation, maintenance and monitoring of the SSD system should be included as part of site management. Until subsurface remediation efforts eventually address VOCs in soil and/or groundwater to acceptable levels (i.e. SSD operation no longer required) operation of the SSD system should continue. At that point, the vapor mitigation system may be shut down and/or removed and O&M requirements would cease.

4.2. Reset. Fans restart automatically in event of power loss.

4.3. In the event of unusual fan noise, failure to start, physical damage, or repeated circuit breaker trip, turn fan off and call for service. MITIGATION TECH -585-637-7430

4.4. Regularly inspect fan gauge to verify that value, indicated by a mark on the gauge, has not changed significantly from the position of the mark. Gauge is inspected by observing the level of colored fluid or, in the case of a dial gauge, the position of the indicator needle.

4.5. Normal system operation requires unchanged structural conditions. Report any changes in structure, HVAC systems, slab conditions, etc., so that the change can be evaluated for impact on the SSD System. For service, call MITIGATION TECH at 585-637-7430

4.6. Ensure that a periodic inspection is performed

5. SUB-SLAB DEPRESSURIZATION SYSTEM PERFORMANCE MONITORING

5.1. Monthly Monitoring

5.1.1. Inspect each fan vacuum indicator to verify that value, indicated by a mark on the gauge, has not changed significantly from the position of the mark. Gauge is inspected by observing the level of colored fluid.

5.1.2. Record the observed measurement for each fan vacuum indicator on form labeled "SSD System Monthly Vacuum Log". Store all forms in the facility maintenance office.

5.1.3. Inspect visible components of SSD system in vicinity of gauge for degraded condition.

5.1.4. Investigate and report any gauge reading that deviates 50% or more from its historical average, or any degraded condition of visible components. For reporting, call MITIGATION TECH at 585-637-7430.

5.2. Annual Inspection

5.2.1. Conduct a visual inspection of the complete System (e.g., vent fans, piping, warning devices, labeling)

5.2.2. Inspect all components for condition and proper operation;

5.2.3. Identify and repair any leaks in accordance with Sections 4.3.1(a) and 4.3.4(a) of the NYS DOH VI Guidance (i.e.; with the systems running, use smoke sticks to check for leaks through concrete cracks, floor joints and at the suction points; any leaks will be resealed until smoke is no longer observed flowing through the opening).

5.2.4. Inspect the exhaust or discharge point of each exhaust fan to verify that no air intakes have been located within 10 feet

5.2.6. Interview appropriate building occupants seeking comments and observations regarding the operation of the System

5.2.7. Check to see that the circuit breakers controlling the circuits on which the soil vapor vent fans operate are labeled "Soil Vapor System"

6. SUB-SLAB DEPRESSURIZATION SYSTEM MAINTENANCE

6.1. Routine Maintenance

6.1.1. Perform procedures as specified in sections 5.2 and 5.3

6.1.2. There are no routine component replacement procedures; Replace components upon findings of damage or failure

6.1.3. All routine and non-routine maintenance activities should be documented and reported to the agencies, as appropriate

6.2. Non-Routine Maintenance

6.2.1. Non-routine maintenance may also be appropriate during the operation of the mitigation system. Examples of such situations include the following:

6.2.2. It is determined through inspection or notification by others that the warning device indicates the mitigation system is not operating properly

6.2.3. the mitigation system becomes damaged

6.2.4. the building has undergone renovations that may reduce the effectiveness of the mitigation system.

6.2.5. Activities conducted during non-routine maintenance visits will vary depending upon the reason for the visit. In general, building-related activities may include examining the building for structural or HVAC system changes, or other changes that may affect the performance of the depressurization system (e.g., new combustion appliances, deterioration of the concrete slab, or other significant changes). Depressurization system-related activities may include examining device or indicator and the vent fan, or measurement of the extent of sub-slab depressurization. Repairs or adjustments should be made to the system as appropriate.

Certification

I hereby certify that the SSD System at this location is installed properly and is effective in achieving its above stated purpose.

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722

55 SHUMWAY ROAD, BROCKPORT, NEW YORK, 14420 * OFFICE/FAX 585-637-7430



1 (-



The World's Leading Radon Fan Manufacturer



GP/XP/XR Series Installation & Operating Instructions

<u>Please Read And Save These Instructions</u> DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

- 1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible of flammable materials.
- 2. WARNING! Do not use fan to pump explosive or corrosive gases. See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion
- 3. WARNING! Check voltage at the fan to insure it corresponds with nameplate.
- WARNING! Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
- 5. **NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.
- 6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
- 7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
- 8. WARNING TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer. b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

RadonAway

3 Saber Way | Ward Hill, MA 01835 www.radonaway.com



INSTALLATION & OPERATING INSTRUCTION IN014 Rev K

XP/XR SeriesXP151p/n 23010-1XP201p/n 23011-1XR261p/n 23019-1

 GP Series

 GP201
 p/n 23007-1

 GP301
 p/n 23006-1

 GP401
 p/n 23009-1

GP401 p/n 23009-1 GP501 p/n 23005-1

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The GP/XP/XR Series Radon Fans are intended for use by trained, professional certified/licensed" after professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a fan. This instruction should be considered as a supplement to EPA / radon industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The GP/XP/XR Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32° F. or more than 100° F.

1.3 ACOUSTICS

The GP/XP/XR Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the GP/XP/XR Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

The GP/XP/XR Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/XP/XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP & XP Series have a wide range of models to choose from to cover a wide range of subslab material. The higher static suction fans are generally used for tighter subslab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drain tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.6 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GP/XP/XR Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/XP/XR Series Fans are **NOT** suitable for underground burial.

For GP/XP/XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

5 CFM	@50 CFM	@100 CEM
/8″	1/4"	3/8″
/4"	3/8"	1 1/2"
	<u>/8"</u> /4"	<u>/8" 1/4"</u> /4" 3/8"



*Typical GP/XP/XR Series Fan operational flow rate is 25 - 90 CFM.

(For more precision, determine flow rate by using the chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

1.7 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (provided with manometer P/N 50017) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.



1.8 ELECTRICAL WIRING

The GP/XP/XR Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The GP/XP/XR Series Fans are rated for use with electronic speed controls however, they are generally not recommended. If used, the speed control recommended is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

2.0 INSTALLATION

The GP/XP/XR Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The GP/XP/XR Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the GP/XP/XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

The GP/XP/XR Series Fan may be optionally secured with the integral mounting bracket on the GP Series Fan or with RadonAway P/N 25007 mounting bracket for an XP/XR Series Fan. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8):



2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

____ Verify all connections are tight and leak-free.

_____ Insure the GP/XP/XR Series Fan and all ducting is secure and vibration-free.

Verify system vacuum pressure with manometer. Insure vacuum pressure is within normal operating range and less than the maximum recommended operating pressure. (Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.) (Further reduce Maximum Operating Pressure by 10% for High Temperature environments) See Product Specifications. If this is exceeded, increase the number of suction points.

Verify Radon levels by testing to EPA protocol.



Attic

Closet

Basement

XP/XR SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the XP & XR Series Fan:

	Typical CFM Vs Static Suction "WC										
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"		
XP151	180	162	140	117	78	46	10	-	-		
XP201	150	130	110	93	74	57	38	20	-		
XR261	250	215	185	150	115	80	50	20	-		

Maximum Recommended Operating Pressure*							
XP151	1.3" W.C.	(Sea Level Operation)**					
XP201	1.7" W.C.	(Sea Level Operation)**					
XR261	1.6" W.C.	(Sea Level Operation)**					

*Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 feet of altitude

	Power Consumption @ 120 VAC	
XP151	45 - 60 watts	
XP201	45 - 66 watts	
XR261	65 - 105 watts	

XP Series Inlet/Outlet: 4.5" OD (4.0" PVC Sched 40 size compatible)
XR Series Inlet/Outlet: 5.875" OD
Mounting: Mount on the duct pipe or with optional mounting bracket.
Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe
Storage temperature range: 32 - 100 degrees F.
Normal operating temperature range: -20 - 120 degrees F.
Maximum inlet air temperature: 80 degrees F.
Size: 9.5H" x 8.5" Dia.
Weight: 6 lbs. (XR261 - 7 lbs)

Continuous Duty Thermally Protected Class B Insulation 3000 RPM Residential Use Only Rated for Indoor or Outdoor Use



GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GP Series Fan:

Typical CFM Vs Static Suction "WC								
	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"	
GP501	95	87	80	70	57	30	5	
GP401	93	82	60	38	12	-	-	
GP301	92	77	45	10	-	-	-	
GP201	82	58	5	-	-	-	-	

	Maximum Recommended Operating Pressure*							
GP501	3.8" W.C.	(Sea Level Operation)**						
GP401	3.0" W.C.	(Sea Level Operation)**						
GP301	2.4" W.C.	(Sea Level Operation)**						
GP201	1.8" W.C.	(Sea Level Operation)**						

*Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 feet of altitude

	Power Consumption @ 120 VAC
GP501	70 - 140 watts
GP401	60 - 110 watts
GP301	55 - 90 watts
GP201	40 - 60 watts

Inlet/Outlet: 3.5" OD (3.0" PVC Sched 40 size compatible)
Mounting: Fan may be mounted on the duct pipe or with integral flanges.
Weight: 12 lbs.
Size: 13H" x 12.5" x 12.5"
Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe
Storage temperature range: 32 - 100 degrees F.
Normal operating temperature range: -20 - 120 degrees F.
Maximum inlet air temperature: 80 degrees F.

Continuous Duty Class B Insulation 3000 RPM Thermally Protected Rated for Indoor or Outdoor Use



IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GPx01/XP/XR Series Fan for shipping damage within 15 days of receipt. Notify RadonAway of any damages immediately. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. Do not attempt to open. Return unit to factory for service.

Install the GPx01/XP/XR Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.





GP Series



Radon Mitigation Fan

All RadonAway[™] fans are specifically designed for radon mitigation. GP Series Fans offer a wide range of performance options that make them ideal for most sub-slab radon mitigation systems.

Features

- Quiet operation
- Water-hardened motor
- Seams sealed under negative pressure (to inhibit radon leakage)
- Mounts on duct pipe or with integral flange
- 3" diameter ducts for use with 3" or 4" pipe
- Electrical box for hard wire or plug in
- ETL Listed for indoor or outdoor use
- 4 interchangeable GP models

_														
		D/N	FAN DUCT	MAX.		AN DUCT MAX. TYPICAL CFM vs. STATIC PR						C PRES	SURE W	'C
	MODEL	P/IN	DIAMETER	WAITS	PRESSURE"WC	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0		
	GP201	23007-1	3"	40-60	2.0	82	58	5	-	-	-	-		
	GP301	23006-1	3"	55-90	2.6	92	77	45	10	-	-	-		
	GP401	23009-1	3"	60-110	3.4	93	82	60	40	15	-	-		
	GP501	23005-1	3"	70-140	4.2	95	87	80	70	57	30	10		



Made in USA with US and imported parts



I 🙆 Al

All RadonAway inline radon fans are covered by our 5-year, hassle-free warranty

For Further Information Contact



The World's Leading Radon Fan Manufacturer



RP Series Installation & Operating Instructions

RadonAway

3 Saber Way | Ward Hill, MA 01835 www.radonaway.com



RadonAway Ward Hill, MA. Series Fan Installation & Operating Instructions <u>Please Read and Save These Instructions.</u>

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

- **1. WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
- 2. WARNING! Do not use fan to pump explosive or corrosive gases. See Vapor Intrusion Application Note #AN001 for important information on VI applications. <u>RadonAway.com/vapor-intrusion</u>
- 3. WARNING! Check voltage at the fan to insure it corresponds with nameplate.
- **4. WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
- **5. NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.
- 6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician
- 7. WARNING! Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
- 8. WARNING! TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.





RP Series

RP140p/n23029-1RP145p/n23030-1RP260p/n23032-1RP265p/n23033-1RP380p/n28208

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1. INTRODUCTION

The RP Series Radon Fans are intended for use by trained, professional, certified/licensed Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of an RP Series Fan. This instruction should be considered as a supplement to EPA/radon industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2. FAN SEALING

The RP Series Fans are factory sealed, no additional caulk or other materials are required to inhibit air leakage.

1.3. ENVIRONMENTALS

The RP Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.4. ACOUSTICS

The RP Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

(To ensure quiet operation of ENERGY STAR qualified in-line and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan). RP Series fans are not suitable for kitchen range hood remote ventilation applications.

1.5. GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the RP Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.6. SLAB COVERAGE

The RP Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/145/155 are best suited for general purpose use. The RP260 can be used where additional airflow is required and the RP265/380 is best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7. CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP Series Fans are **NOT** suitable for underground burial.

For RP Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Dia.	Minimum Rise per Ft of Run*									
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM					
6"	-	3/16	1/4	3/8	3/4					
4"	1/8	1/4	3/8	2 3/8	-					
3"	1/4	3/8	1 1/2	-	-					



*Typical RP1xx/2xx Series Fan operational flow rate is 25 - 90 CFM 0n 3" and 4" pipe. (For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

1.8. SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 50017) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.



1.9. VENTILATION

If used as a ventilation Fan any type of ducting is acceptable, however, flexible nonmetallic ducting is recommended for easy installation and quieter operation. Insulated flexible ducting is highly recommended in cold climates to prevent the warm bathroom air from forming condensation in the ducting where it is exposed to colder attic air. The outlet of the fan should always be ducted to the outside. Avoid venting the outlet of the fan directly into an attic area. The excess moisture from the bathroom can cause damage to building structure and any items stored in the attic. Multiple venting points may be connected together using a "T" or "Y" fitting, Ideally Duct should be arranged such that equal duct lengths are used between intake and "T" or "Y" fitting, this will result in equal flow rates in each intake branch. If adjustable intake grilles are used on multi-intake systems then the opening on each grill should be equal in order to minimize noise and resistance. The Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for each Fan Model is provided in the specification section of these Instructions. Flexible ducting, if used, must always be as close to being fully extended as possible. Formed rigid metal duct elbows will present the least resistance and maximize system performance, recommended bend radius of elbow is at least 1.5 x duct diameter.

RP Series fans are not suitable for kitchen range hood remote ventilation applications. For quietest performance, the fan should be mounted further away from the inlet duct, near the outside vent. A minimum distance of 8 feet is recommended between the fan or T/Y of a multi-intake system and intake grille(s).

Backdraft dampers allow airflow in only one direction preventing cold/hot drafts from entering the vented area and minimize possible condensation and icing within the system while the fan is not operating. Backdraft dampers are highly recommended at each intake grille for bathroom ventilation in all cold climate installations. Installation instructions are included with Spruce back draft dampers.

1.10. ELECTRICAL WIRING

The RP Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.11. SPEED CONTROLS

The RP Series Fans are rated for use with electronic speed controls, however, they are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

2.0 INSTALLATION

The RP Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The RP Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket



2.1 MOUNTING

Mount the RP Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

The RP Series Fan may be optionally secured with the RadonAway P/N 25007 (25033 for RP385) mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation. As the fan is typically outside of the building thermal boundary, and is venting to the outside, installation of insulation around the fan is not required.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.10). Note that the fan is not intended for connection to rigid metal conduit.

Fan Wire	Connection	
Green	Ground	
Black	AC Hot	
White	AC Common	

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

Verify all connections are tight and leak-free.

Insure the RP Series Fan and all ducting is secure and vibration-free.

_____Verify system vacuum pressure with manometer. Insure vacuum pressure is within normal

operating range and less than the maximum recommended operating pressure.

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.) (Further reduce Maximum Operating Pressure by 10% for High Temperature environments) See Product Specifications. If this is exceeded, increase the number of suction points.

Verify Radon levels by testing to EPA protocol.



RP SERIES PRODUCT SPECIFICATIONS

Typical CFM Vs Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140	135	103	70	14	-	-	-	-	-
RP145	166	146	126	104	82	61	41	21	3
RP260	272	220	176	138	103	57	13	-	-
RP265	334	291	247	210	176	142	116	87	52
RP380*	497	401	353	281	220	176	130	80	38

The following chart shows fan performance for the RP Series Fan:

* Tested with 6" inlet and discharge pipe.

	011				
Powe	er Consumption	Maximum Recommended			
120 VAC, 60Hz 1.5 Amp Maximum		Operating Pressure *	(Sea Level Operation)**		
RP140	17 - 21 watts	RP140	0.8" W.C.		
RP145	41 - 72 watts	RP145	1.7" W.C.		
RP260	52 - 72 watts	RP260	1.5" W.C.		
RP265	91 - 129 watts	RP265	2.2" W.C.		
RP380	95 - 152 watts	RP380	2.0" W.C.		

*Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 feet of altitude

			Reduce by 170 per 1000 jeer of difficure	
	Size	Weight	Inlet/Outlet	L.2
RP140	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)	25
RP145	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)	15
RP260	8.6H" x 11.75" Dia.	5.5 lbs.	6.0" OD	48
RP265	8.6H" x 11.75" Dia.	6.5 lbs.	6.0" OD	30
RP380	10.53H" x 13.41" Dia.	11.5 lbs.	8.0" OD	57

L.2 = Esti can be acc

Recommended ducting: 3" or 4" RP1xx/2xx, 6" RP380, Schedule 20/40 PVC Pipe

Mounting: If used for Ventilation use 4", 6" or 8" Rigid or Flexible Ducting

Mount on the duct pipe or with optional mounting bracket.

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

Thermally Protected

3000 RPM

Rated for Indoor or Outdoor Use



RP140 and RP260 Only.



IN020 Rev N

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the GP/XP/XR/RP Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

T	WARRANTY	Ŷ
	Subject to any applicable consumer protection legislation, RadonAway warrants that the GPX01/XP/XR/RP Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").	
	RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.	
	This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.	
	5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.	
	RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.	
	RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.	
	EXCEPT AS STATED ABOVE, THE GPx01/XP/XR/RP SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.	
	IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.	
	For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.	
	RadonAway	
	3 Saber Way Ward Hill, MA 01835	
	TEL. (978) 521-3703 FAX (978) 521-3964	
	Record the following information for your records:	
	Serial No	
	Purchase Date	
SE		



RP Series



Radon Mitigation Fan

All RadonAway[™] fans are specifically designed for radon mitigation. RP Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features

- Energy efficient
- Ultra-quiet operation
- Meets all electrical code requirements
- Water-hardened motorized impeller
- Seams sealed to inhibit radon leakage (RP140 & RP145 double snap sealed)
- RP140 and RP260 Energy Star® Rated
- ETL Listed for indoor or outdoor use
- Thermally protected motor
- Rated for commercial and residential use

MODEL	D/N	FAN DUCT		WATTS MAX. PRESSURE"WC	TYPICAL CFM vs. STATIC PRESSURE WC				
MODEL	P/N	DIAMETER	WAITS		0"	.5"	1.0"	1.5"	2.0"
RP140*	23029-1	4"	15-21	0.8	135	70	-	-	-
RP145	23030-1	4"	41-72	2.1	166	126	82	41	3
RP260*	23032-1	6"	50-75	1.6	272	176	89	13	-
RP265	23033-1	6"	91-129	2.3	334	247	176	116	52
RP380*	28208	8"	95-152	2.3	497	353	220	130	38



Made in USA with US

ETL Listed



All RadonAway inline radon fans are covered by our 5-year, hassle-free warranty



For Further Information Contact

FEDERAL SIGNAL CORPORATION



StreamLine® Low Profile Steady Burning Light

Models LP3MI, LP3PI, LP3TI

COMPACT, ECONOMICAL AND FLEXIBLE

- Available in 24VDC and 120VAC
- T-mount, integrated $\frac{1}{2}$ inch pipe mount or $\frac{1}{2}$ - inch male pipe mount
- Incandescent lamp included
- Five dome colors
- Screw-on lens
- Type 4X enclosure
- Optional wire guard
- UL and cUL Listed and CSA Certified

Federal Signal introduces the Model LP3I low profile steady burning light. The Type 4X light is available in five colors: amber, blue, clear, green, and red.

The LP3I is offered in three mounting configurations. LP3PI features an integrated ¹/₂-inch NPT pipe mount. LP3MI features an integrated ¹/₂-inch male pipe mount. The "T-mount" LP3TI has a popular 2-hole design for wall or flush mounting.

Both the LP3MI and LP3TI include a surface gasket to complete the Type 4X installation. All LP3I units feature a threaded screw-on lens. The LP3I comes in two voltages: 24VDC and 120VAC.

A 15-watt incandescent lamp is included with all units. The lamp features a standard double-contact bayonet base readily available when replacement is required.

Like all Streamline[®] products, the LP3I is designed with OEM applications in mind. It is economical, easy to install and attractive. Careful consideration has been given to the relationship between lamp shape and lens design for maximum light output.

When your application calls for a compact signal with unparalleled reliability, Federal Signal's Streamline products are the clear choice.

Model	Voltage	Power	Operating Current
LP3I	24VDC	15-watts	0.67 amps
LP3I	120VAC	15-watts	0.13 amps



STREAMLINE® LOW PROFILE STEADY BURN LIGHT (LP3MI/LP3PI/LP3TI)





SPECIFICATIONS

Operating Temperature:	-31°F to 150°F	-35°C to 65°C
Net Weight:	7.3 oz.	206.96 g
Shipping Weight:	8.5 oz.	240.98 g
Diameter:	3.13"	7.95 cm
Height (from bottom):		
LP3PI	5.7"	14.48 cm
LP3MI	5.8"	14.7 cm
LP3TI	5.1"	12.95 cm

HOW TO ORDER

- Specify model, voltage and color
- Specify options (wire guard LP3G)
- Please refer to Model Number Index LP3I beginning on page 373

* Optimal hours under ideal conditions.

REPLACEMENT PARTS

<u>Description</u>	<u>Part Number</u>	<u>Description</u>	<u>Part Number</u>
Lens, Amber	K8589063A	Lamp, 120VAC	K8107194A
Lens Blue	K8589063A-01	Lamp, 24VDC	K8107227A
Lens, Clear	K8589063A-02	Gasket, LP3TI	K8589012A
Lens, Green	K8589063A-03	Gasket, Lens	K8589013A
Lens, Red	K8589063A-04		



Series 160

Stainless Steel Pitot Tubes

ASME Design Meets AMCA and ASHRAE Codes



Standard Model 160 Pitot Tube

Ideal for use with our precision manometers and air velocity gages, Dwyer® Pitot Tubes are constructed from corrosion resistant stainless steel for a lifetime of service. ASME design meets AMCA and ASHRAE specifications for maximum accuracy over a wide variety of flow conditions. No correction factors required as ASHRAE tip design yields a calibration factor of 1. ASHRAE design needs no calibration! Permanent, stamped insertion depth graduations on sides of 160 series facilitate accurate positioning. Static pressure port is parallel to sensing tube allowing quick, easy alignment of tube with air flow. Low sensitivity to misalignment gives accurate reading even when tube is misaligned up to 15 degrees. Various standard sizes are available for use in ducts as small as 4" dia. or as large as 36 ft dia. A universal model fits user supplied 3/4 "schedule 40 (standard) pipe in any length. Several convenient mounting options are available for permanent installations.

• No calibration needed.

Air Velocity

- · Precisely located, burr-free static pressure holes.
- Hemispherical tip design, best for accuracy if imperfectly aligned and nearly impossible to damage.
- · Long lasting 304 SS construction.
- · Silver soldered connections for leak-proof operation.
- Coefficient of "1."
- 5/16" models rated to 1500°F.
- Extended static connection helps guide tip within recommended 15° of air flow direction.
- · Inch graduations on sides of 160 series to quickly determine exact insertion depth.
- Dwyer® Air Velocity Calculator, direct reading flow charts and instructions included.
- Use 1/8" models in ducts as small as 4", 5/16" models in ducts 10" or larger.
- · Optional mounting gland or split flange make permanent installation fast and simple.

Series 160 is designed to meet:

- ASME "Fluid Meters" 6th Ed.
- ANSI/AMCA 210-99
- ANSI/ASHRAE 51-1999
- British Standard 1042

ACCESSORIES

No. A-158 Split Flange Mounting can be added to any Dwyer® No. 160 Standard Pitot Tube. Cadmium plated steel. Gasket is pattern for mounting holes. Secure flange loosely to tube, adjust tube depth and tighten screws. Gasket of 1/16" Neoprene fits tightly around tube and against duct for leak-proof seal. Nuts, washers included.

No. A-159 Mounting Gland - No. A-159 Mounting Gland — Versatile adapter slips on any Series 160, 5/16" standard Pitot tube made after Dec. 1990. Two-part stainless steel fitting slides over tube and provides permanent, secure mounting. Where duct interior is accessible, use the washers and jam nut supplied. For blind applications or in thicker materials, use model A-156 flange mounting plate. Once tube is adjusted to proper depth and angle, tighten smaller hex bushing to lock position. Graphite bushing inside assures leakproof seal even at higher temperatures. TFE bushing also available. NOTE: For full insertion with this fitting, order next longer Pitot tube

No. A-397 Step Drill. For fast, convenient installation of Pitot tubes in sheet metal ducts. No center punch needed; automatic de-burring. Drills six sizes from 3/16"-1/2" in 1/16" increments.



A-158 Split Flange Mounting

A-159 Mounting Gland is used for both duct mounting and flange mounting. To flange mount, the A-159 must be used with the A-156 flange mounting plate.



NPT

with 1/2" female NPT







*Universal model for permanent installation and connection to metal tubing. Make any length Pitot tube with 3/4" schedule 40 pipe, 3/4" to 1/2" reducing bushing and 1/4" metal tubing.



Series A3000 Photohelic® Differential Pressure Switch/Gage

Specifications - Installation and Operating Instructions



The PHOTOHELIC® Series A3000 is a versatile 2-in-1 instrument combining a time-proven Magnehelic® differential pressure gage with low/high pressure switches. It is designed to measure and control positive, negative or differential pressure of air or other non-combustible, non-corrosive gases. Gage reading is unaffected by switch operation. Switch set points are easily adjusted with knobs located on gage face. Applied pressure and switch set points are fully visible at all times. Deadband is one pointer width, less than 1% of full scale. Each set point controls a DPDT relay and both relays can be interlocked to provide variable deadband control.

SPECIFICATIONS GAGE SPECIFICATIONS

Service: Air and non-combustible, compatible gases.

Wetted Materials: Consult factory.

Accuracy: $\pm 2\%$ of full scale at 70°F (21.1°C). $\pm 3\%$ on -0 and $\pm 4\%$ on -00 models.

Pressure Limits: -20" Hg. to 25 psig (-0.677 to 1.72 bar). MP option; 35 psig (2.41 bar), HP option; 80 psig (5.52 bar). 36003S – 36010S; 150 psig (10.34 bar). 36020S and higher;1.2 x full scale pressure.

Temperature Limits: 20 to 120°F.

(-6.67 to 48.9°C) Low temperature option available.

Process Connections: 1/8" female NPT.

Size: 4⁻ (101.6 mm) dial face, 5⁻ (127 mm) O.D. x 8-1/4⁻ (209.55 mm).

Weight: 4 lb (1.81 kg).

SWITCH SPECIFICATIONS

Switch Type: Each setpoint has 2 Form C relays (DPDT). **Repeatability:** ±1% of full scale.

Electrical Rating: 10A @ 28 VDC, 10A @ 120, 240 VAC.

Electrical Connections: Screw terminals. Use 167°F (75°C) copper conductors only.

Power Requirements: 120 VAC, 50/60 Hz; 240 VAC & 24 VAC Power optional.

Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

Set Point Adjustment: Adjustable knobs on face.

Agency Approvals: Photohelic® UL: File No. E38121, Vol. 1, Sec. 4; CSA: File No. LR22541-34; CE: EN 61000-6-2: 1999, EN 6100-3-2: 2000, EN 61000-3-3: 2000.

Optional Explosionproof enclosure does not possess an agency approval.



NOTE: Detailed dimension drawings are available from our Customer Service Dept. for PHOTOHELIC[®] switch/gages as installed in two optional enclosures. For weatherproof housing, request no. 13-700132-00. /For explosion-proof housing, request no. 13-700113-01.

INSTALLATION

1. Location: Select a clean, dry, vibration-free location where ambient temperatures will be between 20 and 120°F (-6.67 and 48.9°C). Tubing supplying pressure to the instrument can be practically any length but long runs will increase response time slightly.

2. Position: The PHOTOHELIC® Switch/Gage is factory calibrated for use with scale in a vertical plane. Operation at other angles may affect accuracy and/or require zero adjustment. Most models can be specially calibrated at the factory for other positions if specified at time of ordering. Ranges below 1° W.C. must be used only with scale vertical.

3. Mounting: The PHOTOHELIC[®] is normally mounted before making electrical connections. The electrical enclosure is removable at any time regardless of mounting method.

(A) Panel Mounting: Normal mounting is flush or through panel as shown in Fig. B. Allow $4^{-3}/_{8}^{-1}$ (111.13 mm) clearance behind the unit for removal of electrical enclosure. Make a $4 \cdot 13/16^{-1}$ (122.24 mm) diameter hole in panel. Insert the PHOTOHELIC[®] unit from front of panel and slip mounting ring over case from behind with stepped side facing rear. Fit the snap ring into narrow groove at back edge of the bezel. Thread four $6 \cdot 32 \times 1 \cdot 1/4^{-1}$ mounting screws into tapped holes in mounting ring and seat it against snap ring. Tighten screws against back of panel. See Fig. B.



Fig. B

DWYER INSTRUMENTS, INC.

P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361, U.S.A.

Phone: 219/879-8000 Fax: 219/872-9057

www.dwyer-inst.com e-mail: info@dwyer-inst.com **(B)** Surface Mounting with Remote Relays: Where it is preferred to mount the amplifier-relay unit separate from the gage assembly, the gage is mounted as shown in Fig. B (without amplifier-relay package) or surface mounted as shown in Fig. C. Use the dimensions in Fig. D to locate holes.



(C) Remote Relays Mounting: On factory supplied RMR (remote mounted relay) units, the amplifier-relay package will be furnished attached to a mounting plate as shown in Fig. E. Use the hole layout in Fig. F for this option. A five foot cable assembly is included for connecting the two components. Longer cable lengths are available from the factory.



4. Pneumatic Connections & Zeroing: After installation but before making pressure connections, set the indicating pointer exactly on the zero mark, using the zero adjust screw located at the bottom of the front cover. Note that this adjustment can only be made with the high and low pressure taps both open to atmosphere.

Connect the high and low pressure taps to positive, negative, or differential pressure sensing points. Use $1/4^{-}$ diameter metal or other instrument tubing and $1/8^{-}$ NPT adapters at the PHOTO-HELIC[®] pressure switch/gage. Adapters for rubber or soft plastic tubing are furnished with the instrument for use where this type of connection is preferred.

If the PHOTOHELIC[®] is not used to sense differential pressure, one of the pressure taps must be left open to atmosphere. This will allow the reference pressure to enter. In this case, installation of a Dwyer No. A-331 Filter Vent Plug or similar fitting in the reference pressure tap is recommended to reduce the possibility of dust entering the instrument.

NOTE: If the PHOTOHELIC[®] switch/gage is over pressured, pointer may "jump" from full scale back to zero and remain there until the excess pressure condition is relieved. Users should be aware of possible false zero pressure indications under this condition.

ELECTRICAL CONNECTIONS

1. Cover: The amplifier-relay unit has an easy to remove housing. Remove the three (3) screws as shown in Fig. G and slide the housing off. Make all the electrical connections before reinstalling and refastening the housing.

2. Conduit: Electrical access to the connection box portion of the relay housing is by bottom opening for 3/4⁻ conduit. Use of flexible conduit is recommended. It should be supported from the panel or other suitable surface to prevent the wiring system from exerting undue strain on the instrument. See Fig. G.



3. Terminal or Connection Board Layout: In Fig. H "Terminal Board," Section A contains the connections for the load or slave relay actuated by the high or right set point. This relay is a double pole, double throw type. The two right connections are normally closed, the two middle connections are normally open, and the left connections are the common pair. The relay is in its normal or De-Energized position when pressure is below the right hand set point.

Section D is exactly the same as **Section A** except that its load or slave relay is controlled by the low or left set point. The De-Energized position is below the left hand pointer set point.

Section B contains the external connections to the holding coil circuit for the high or right set point relay and **Section C** contains similar connections for the low or left set point relay. The function and use of these connections varies somewhat depending on the circuit style of the instrument. See paragraphs 5 and 6 for details.



Section E contains the power connections for the control unit transformer primary. The transformer in turn supplies reduced voltage power for the LED, phototransistor, amplifier unit, and load relay pull in and hold coils. Connections must always be made to this section in order to put the unit in operation. Standard units are designed for 120 VAC input to the transformer. Special units are also available for other voltages.

Separate Ground Wire attachment is provided for by a No. 6-32 screw on the mounting bracket near the conduit opening. An additional ground wire connection is located on the side of the gage body for use when the amplifier-relay unit is mounted remotely.

Single Set Point instruments are furnished with the right or high set point components and circuitry in place. These are connected to Sections A and B of the terminal board. The left or low set point components are omitted.

4. Circuit Style: The PHOTOHELIC[®] is available with several factory installed optional internal circuits. They are identified as to style by a label shown in Fig. J. This label is mounted prominently on the terminal board of each instrument. The letter H denotes a circuit in which the relay can be made to latch or remain energized after pressure increase to its set point.

The letter L denotes a circuit in which the relay can be made to latch or remain de-energized after pressure decrease to its set point. Two letters are required to fully identify a dual set point unit. Thus, circuit style HH, which is standard, is a dual set point circuit which has provisions for latching on pressure increase to either set point. Single relay unit or L for the special low latch unit. Units for use with other than standard 120 VAC will be so indicated on the label.



Fig. J

5. Dual Set Point Automatic Reset: Circuit Style HH is used for simple on-off switching applications. To place in service, connect load circuits to the appropriate terminals in Section A (Fig. H) for the right set point and Section D for the left set point. Note that the N.O. contacts are open when the gage pressure pointer is to the left of the set point pointers. No connections are necessary in Sections B and C. Make external ground connections as required and connect power to Section E for the control unit. To use circuit style LL for automatic reset, a jumper wire must be installed between the two terminals in Sections B and/or C.

6. Dual Set Point Manual Reset: Circuit Style HH may also be used for manual reset applications where it is required to maintain contact on either relay following pressure increase above its set point. Load or signal connections are made to the appropriate terminals in Sections A and D (as in paragraph 5 above). Connect terminals in Sections B and C through normally closed switches or push buttons as shown in Fig. K. Use of "dry-circuit" type switches such as a Dwyer Part No. A-601 with paladium, gold, etc. or rotary wiping action type contacts is recommended. Make external ground connections as required and connect power to Section E for the control unit.

Circuit style LL is used for manual reset applications which require that contact be maintained following pressure decrease below the set point. Load connections are made to the appropriate terminals in Sections A and D. A normally open type manual reset switch such as Dwyer Part No. A-601 is connected to the terminals in Sections B and C. The circuit must be "armed by momentarily closing the switch while the black pointer is to the right of the set point. From that point on, the circuit will latch on pressure decrease below the set point and remain latched on pressure increase until manually reset with the optional switch.





7. Dual Set Point Automatic and Manual Reset Combinations: Circuit Style HH may be used with either set point wired and operating as in paragraph 5 above and the other set point wired and operating as in paragraph 6.

8. High Low Limit Control - Dual Set Point: Circuit Style HH may be used to control fans, dampers, pumps, etc., between the set points of a PHOTOHELIC[®]. To accomplish this, use one set point relay to reset the other as shown in the wiring diagram Fig. L. In this typical application, the load (for instance a fan) would be connected to the N.C. contacts for the right set point relay Section A (Fig. H). On pressure rise to the right set point, its relay would pull in and hold even though pressure might then fall below that set point . I the pressure continued to fall to the left set point, its relay would automatically be DE-ENERGIZED, return to its normal position and in so doing, open the holding coil circuit from Section B (Fig. H). The right set point relay would thus be reset and the cycle could repeat.

9. Dual Set Point Special Purpose Circuits: Circuit Style LL may be used where manual reset following maintained contact on pressure decrease to either set point is required. Circuit Styles HL and LH are combination units. For special combinations of features, special units, and detailed instructions regarding their use, consult the factory.

10. Single Set Point PHOTOHELIC*: The single set point PHO-TOHELIC* is furnished with the right set point only. Terminals in Sections A and B (Fig. H) are connected to this relay. Circuit Style SRH is wired for automatic reset as in paragraph 5 above. Manual reset is accomplished by adding a normally closed reset switch or push button to the circuit as described in paragraph 6 above. **11. Single Set Point Special:** Manual reset after actuation on falling pressure can be obtained by using Circuit Style SRL. Consult the factory for special units and detailed instructions regarding their use.

12. Placing in Service: In normal operation each relay is de-energized when the pressure applied to the instrument is below its set point. Special low-latching units will ordinarily have to be reset before placing on the line in normal operation.



13. Failure Mode: The PHOTOHELIC® circuit design provides certain protection in the event of a loss of pressure or electrical power. In either case, both relays will de-energize, returning to their normal "zero pressure" state. The exceptions to this are models with center zero ranges. Because the relays on all standard models are always energized when the indicating (black) pointer is to the right of their respective set points, the relay action on loss of pressure will depend on set point position, since either of them could be located to the left of zero. As an example; if the left pointer were set at -2 in. w.c. and negative pressure was -3 in. w.c., a loss of that pressure would allow the black pointer to return to the center and thus cause the low set point relay to energize.

If the LED should burn out, only the left-low relay will de-energize. The right-high relay will react as if pressure were above its set point and will remain energized even though pressure might be below that setting. In this situation, only termination of electrical power will allow the right-high relay to de-energize.

MAINTENANCE AND SERVICE

Dwyer PHOTOHELIC[®] Switch/Gages are precision instruments, expertly assembled and calibrated at the factory. They require no lubrication or periodic servicing. If the interior is protected from dust, dirt, corrosive gases and fluids, years of trouble-free service may be expected. Zero adjustment should be checked and reset occasionally to maintain accuracy. The PHOTOHELIC[®] is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization (RGA) number before shipping.

©Copyright 2008 Dwyer Instruments, Inc.

Printed in U.S.A. 6/08

FR# 13-440202-04 Rev. 4

DWYER INSTRUMENTS, INC. P.O. BOX 373 • MICHIGAN CITY, INDIANA 46361, U.S.A.

Phone: 219/879-8000 Fax: 219/872-9057 www.dwyer-inst.com e-mail: info@dwyer-inst.com

APPENDIX I

ELECTRONIC COPY

