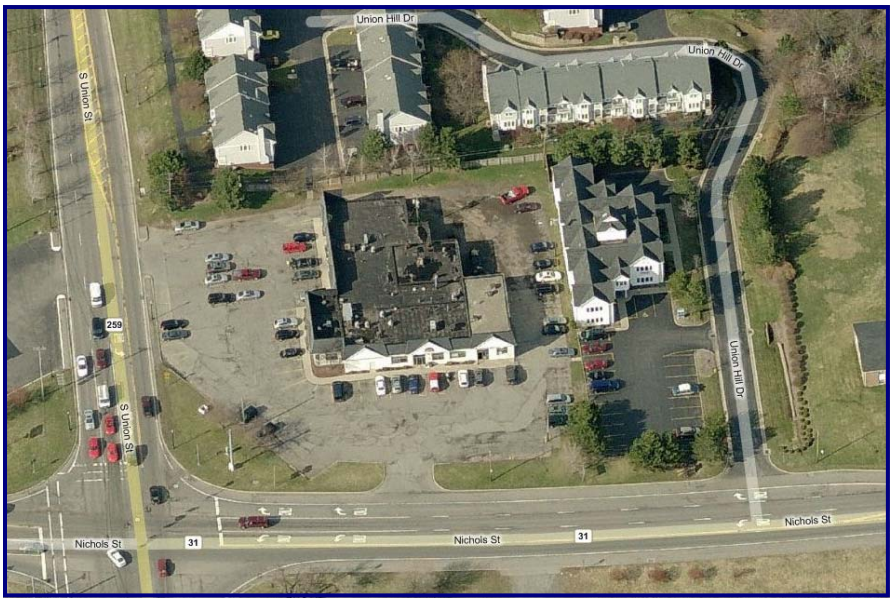
Remedial Action Work Plan

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

Revised April 2014 0188-013-001

Prepared For:

Eyezon Associates, Inc.



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SPENCERPORT, NEW YORK

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Prepared for:

EYEZON ASSOCIATES, INC.

Prepared by:

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

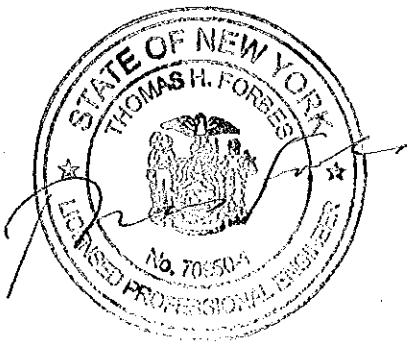
In Association With:

TURNKEY
ENVIRONMENTAL
RESTORATION, LLC

Certification

I, Thomas H. Forbes, certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan (RAWP) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

4-10-14
Date



REMEDIAL ACTION WORK PLAN
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Spencerport, New York

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1.0 INTRODUCTION

Benchmark Environmental Engineering and Science, PLLC (Benchmark), in association with TurnKey Environmental Restoration, LLC (TurnKey), referred to herein as TurnKey has prepared this Remedial Action (RA) Work Plan on behalf of Eyezon Associates, Inc. (Eyezon). Eyezon has elected to pursue cleanup and redevelopment of the property, located at 500 South Union Street, Spencerport, New York (see Figures 1 and 2), under the New York State Brownfield Cleanup Program (BCP or Program) and executed a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC).

This document presents the scope of work and procedures for completion of planned remedial activities on the Site. The remedial activities will be completed by remedial construction contractors under contract to Eyezon and/or TurnKey/Benchmark. The work will be completed in general accordance with 6NYCRR Part 375 and NYSDEC DER-10 guidelines.

1.1 Site Background

The subject property (hereinafter, the "Project Site" or the "Site") is an approximate 1.2 acre parcel consisting of an approximate 12,750 square foot, multi-tenant commercial building, with the remainder of the Site primarily covered by asphalt and concrete, and landscaped areas.

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 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.

Prior to 1986, spent filters from the commercial dry-cleaning operation were reportedly disposed in dumpsters located outside the building on the eastern portion of the Site. Subsurface investigations identified the presence of chlorinated volatile organic compounds (cVOCs), specifically tetrachloroethene (PCE) and its chemical breakdown products trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC) in both soil and groundwater on-site. PCE is a common dry-cleaning solvent historically used on-site. The distribution of PCE and other cVOCs in groundwater suggests

that on-site contamination may have originated from the general area in which the spent dry-cleaning filters were disposed in on-Site dumpsters.

1.2 Previous Environmental History

A summary of the findings of the environmental investigations completed at the Site is provided below. Figure 3 shows the historic and RI sample locations. Soil and groundwater analytical summary tables from the approved Remedial Investigation/Alternatives Analysis Report are provided electronically in Appendix D.

1.2.1 *November 1998 – Phase I/II Environmental Site Assessment*

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 included the completion of eight soil borings (B-101 through B-108) advanced into a native lacustrine silt unit identified at a depth between 17 and 22 feet below ground surface (fbgs). Three of the borings were subsequently converted to shallow monitoring wells (MW-103, MW-106, and MW-107), each 17 fbgs, in order to investigate recognized environmental concerns (RECs) identified in the Phase I ESA. Figure 3 shows the approximate boring and well locations.

Recovered soil samples were screened in the field using a portable photoionization detector (PID); only borings B-101 (172 ppm maximum at 7 fbgs) and B-105 (259 ppm maximum at 0.5 fbgs) exhibited elevated PID screening results. Soil samples were subsequently collected from borings B-101 (8-10 fbgs), B-104 (6-8 fbgs), B-105 (0-2 fbgs), and B-107 (6-8 fbgs) and submitted for Target Compound List (TCL) VOC analyses. Groundwater samples were collected from the three shallow monitoring wells for total VOC and STARS List VOCs via Method 8260. Depth to the shallow groundwater table within the three monitoring wells ranged from 4.3 to 9 fbgs; shallow groundwater was estimated by H&A to flow in a southwesterly direction.

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.

1.2.2 *April 2008 – Phase I ESA & Phase II Site Investigation*

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 included the completion of six soil borings/piezometers (SB-1/PZ-1 through SB-6/PZ-6) and four soil borings (SB-7 through SB-10) advanced from ground surface to approximately 15 to 18 fbgs. Based on field screening observations and headspace determinations using a PID, soil samples were collected from borings SB-1/PZ-1 (13.5-15 fbgs), SB-3/PZ-3 (12-13.5 fbgs), SB-5/PZ-5 (16.5-18 fbgs), SB-6/PZ-6 (15-16.5 fbgs), SB-8 (10-12 fbgs), and SB-9 (18-20 fbgs) for TCL and STARS List VOCs via Method 8260. In addition, groundwater samples were collected from the six piezometers for the same analyses. Depth to groundwater ranged from 0.70 fbgs to 3.68 fbgs and groundwater flow direction was determined and estimated to flow in a southwesterly direction. Figure 3 shows the approximate boring and piezometer locations.

Analytical 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. The cVOC analytes exceeding GWQS were detected in each of the six piezometers during the 2008 investigation, with the highest concentrations of total cVOCs (PCE, TCE, and cis-1,2-dichloroethene) detected at sample location PZ-5 (1,642 µg/L). PCE was detected at soil sample location SB-9 (18-20 fbgs) at a concentration (2.9 mg/kg) that exceeded the Unrestricted Use and Groundwater Protection SCOs but not the Commercial Use SCO.

1.2.3 *July 2008 – Additional Subsurface Investigation*

TurnKey conducted an Additional Subsurface Investigation at the Site in June 2008. This investigation included completion/installation of one off-site soil boring/piezometer (PZ-7) to approximately 16 fbgs and sampling of existing on-site groundwater monitoring well MW-106. This investigation was performed to further assess upgradient and downgradient groundwater quality following the identification of chlorinated-impacts to site groundwater during previous investigations (see Figure 3). Groundwater samples from the new off-site piezometer and existing on-site monitoring well were collected and submitted

for TCL VOC analysis via Method 8260. The samples indicate the presence of PCE in the on-Site well and cis-1,2-dichloroethene (cis-1,2-DCE) in the off-Site piezometer above the NYSDEC GWQS. Monitoring locations are shown on Figure 3.

1.2.4 *October 2008 – Geotechnical Engineering Report*

A geotechnical subsurface exploration program was conducted at the Site by Empire Geo-Services, Inc. in September 2008. The investigation included the advancement of six test borings. Borings B-1 through B-3 were advanced to approximately 25 fbgs, and borings B-5 and B-6 were advanced to 10 fbgs. Only boring B-4 was advanced to refusal at approximately 28.5 fbgs, which was assumed to be the top of bedrock at the Site. This assumption was not confirmed by rock coring methods to determine the actual nature of the refusal (i.e., bedrock vs. a large cobble or boulder). Groundwater was only encountered in boring B-6 at approximately 6 fbgs. Figure 3 shows the approximate boring locations.

1.2.5 *Active Subslab Depressurization System IRM Work Plan*

An Active Subslab Depressurization (ASD) System IRM Work Plan was prepared 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.

1.2.6 *Remedial Investigation / Alternatives Analysis Report (RI/AAR)*

A Remedial Investigation was completed 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.

Six additional soil borings were advance to depth between approximately 20 to 31 fbgs, and identified as MW-1D, MW-2D, MW-3, MW-4D, MW-5D and PZ-8, respectively. The newly installed piezometer and monitoring wells were developed, and samples were collected from MW-1D, MW-2D, MW-3, MW-4D, MW-5D, MW-103, and MW-106, as well as piezometers PZ-1, PZ-2, PZ-4, PZ-5, PZ-6, and PZ-8 via low-flow procedures in September 2010. All groundwater samples were analyzed for TCL VOCs (plus TICs) via USEPA SW-846 Method 8260. Additionally, groundwater samples collected from the newly

installed monitoring wells and existing wells MW-103 and MW-106 were submitted for TCL SVOCs (plus TICs), TAL Metals plus Cyanide, PCBs and Pesticides/Herbicide analyses.

A second groundwater sampling event from the same monitoring wells/piezometers was completed in May 2011. All groundwater samples were analyzed for TCL VOCs (plus TICs) via USEPA SW-846 Method 8260B. In addition and with NYSDEC-approval, groundwater samples collected from wells MW-4D and MW-103 were submitted for TCL SVOCs (plus TICs); samples collected from wells MW-1D and MW-4D were submitted for TAL Metals; and samples collected from wells MW-2D, MW-3, MW-4D, and MW-5D were submitted for Pesticides/Herbicide analyses.

A surface soil sampling program was conducted in the northernmost unpaved portion of the Site. Surface soil data collected during the RI sampling program supplemented existing soil data and was used to evaluate potential human health risks. Surface soil samples, identified as SS-01 through SS-03, were collected beneath the vegetated sod layer from the uppermost two inches and submitted for analysis of TCL VOC (plus TICs), TCL SVOCs (plus TICs), Pesticides/Herbicides/PCBs, and TAL Metals plus cyanide.

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.

Results of the RI and previous investigations are summarized below and tabulated in Appendix D.

1.2.7 *Summary of Environmental Conditions*

Based on the Remedial Investigation and historic investigations, the following environmental conditions exist at the Site:

Geology/Hydrogeology

- Soil at the site consists of fill materials consisting of varying amounts of gravel, brick, ash and concrete that is up to 6 feet thick. Native soil consists of medium/coarse sand and gravel to depths of at least 30 fbgs.

- The uppermost water bearing unit is within an unconfined sand and gravel layer. The depth to groundwater from ground surface ranges between about 13 to 26 feet. Groundwater in the uppermost water bearing unit generally flows toward the southeast, which is consistent with regional groundwater flow based on our knowledge of hydrogeology at other nearby BCP sites.

Contamination

Surface Soil

- VOCs were not detected above Unrestricted Use SCOs in any of the three surface soil samples.

- Benzo(a)pyrene was the only SVOC detected at a concentration (1.5 mg/kg) slightly above its Commercial Use SCO (1.0 mg/kg) but well below the Protection of Groundwater SCO (22 mg/kg) at surface soil samples SS-1 and SS-3. Benzo(a)pyrene is a PAH that tends to be ubiquitous in the environment, particularly in commercial settings with high vehicular traffic.

- No surface and near surface soil samples detected metal concentrations above Commercial or Protection of Groundwater SCOs. Lead and zinc were detected at concentrations slightly above their Unrestricted SCOs.

- Pesticides, herbicides, and PCBs were not detected in surface soil above Commercial or Protection of Groundwater SCOs. The concentrations of 4,4'-DDE and 4,4'-DDT detected in SS-3 were slightly above the Unrestricted SCO.

Subsurface Soil

- SVOCs, inorganic compounds, pesticides, herbicides, and PCBs were not detected in subsurface soil/fill at concentrations above the Part 375 SCOs.

- VOC concentrations in all historical and RI subsurface soil samples were well below Part 375 Commercial Use SCOs. Four historic samples exceeded the Protection of Groundwater SCOs for one or more compounds; however, only one compound (ethylbenzene) was detected slightly above its Protection of Groundwater SCO (1.4 mg/kg over 1.0 mg/kg) from one historic sample location (B105) in unsaturated soil. Furthermore, ethylbenzene is a petroleum compound and was not detected in other soil samples on-Site, and therefore not a constituent of concern for the Site. PCE was the only compound detected above its Protection of Groundwater SCO and was also detected above GWQS/GVs; the

highest concentration of PCE (14.67 mg/kg) was detected in a saturated soil sample B101 (8-10 fbgs).

Groundwater

- Concentrations of iron, magnesium, manganese, and sodium were detected above GWQS/GVs in both shallow and deep monitoring wells across the Site during both monitoring events (e.g., September 2010 and May 2011). However, these compounds are naturally occurring minerals and are considered to be representative of Site background conditions. Cadmium in well MW-1D and cobalt in well MW-4D were detected slightly above their respective GWQSs during the September 2010 event; however, both were reported below their GWQS/GV during the May 2011 event.
- Five SVOCs (PAHs) [benzo(a)anthracene, benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, and indeno(1,2,3-cd)pyrene] exceeded their respective GWQSs during the September 2010 groundwater sampling event at only one location (MW-103). However, these detections were flagged with a "J" qualifier indicating estimated concentrations. Subsequent SVOC results from the May 2011event indicated all of these PAH concentrations were below the GWQSs.
- Pesticides, herbicides, and PCBs were not detected in groundwater above GWQS/GVs.
- cVOCs are the primary COCs in groundwater, with PCE and/or its breakdown products (TCE and cis-1,2-DCE, and VC) detected above GWQS/GV in several piezometers and monitoring wells on-Site.
- The highest total cVOCs concentrations were observed in shallow wells/piezometers PZ-5 (4,168 ug/L) and MW-3 (1,770 ug/L) and deep wells MW-2D (2,068 ug/L) and MW-4D (1,901 ug/L).
- One cVOC (cis-1,2-DCE) was observed at concentration of 20 ug/L at off-site piezometer PZ-7 during a previous investigation.

Soil Vapor

- Individual VOC concentrations ranged from non-detect (ND) (several locations) to 980 ug/m^3 (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 Primary Constituents of Concern (COCs)

Based on findings of the RI and previous investigations, the site-specific Constituents of Concern (COCs) are comprised of certain chlorinated VOCs and polycyclic aromatic hydrocarbons (PAHs). Specifically, the site-specific COCs are identified as tetrachloroethene (PCE) and its chemical breakdown products trichloroethene (TCE), cis-1,2-dichloroethene (1,2-DCE) and vinyl chloride (VC) in groundwater, and benzo(a)pyrene in the surface soils.

1.4 Remedial Action Objectives

The remedial actions for the 500 South Union Street Site must satisfy Remedial Action Objectives (RAOs). Remedial Action Objectives are site-specific statements that convey the goals for minimizing substantial risks to public health and the environment. For the Site, appropriate RAOs have been defined as:

Groundwater:

RAO for Public Health Protection

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

RAO for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.

Soil:

RAO for Public Health Protection

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

RAO for Environmental Protection

- Prevent migration of contaminants that would result in groundwater contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Soil Vapor:

RAO for Public Health Protection

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

In general, remedial activities will include: completion of in-Situ injection of biological amendments to degrade cVOCs, limited surface soil excavation and off-Site disposal; soil cover placement; installation of an active sub-slab depressurization system within the building; and, implementation of a Site Management Plan. Details of the planned remedial action are presented in Sections 2 and 3.

1.5 Project Organization and Responsibilities

Eyezon was accepted into the BCP as a non-responsible party (volunteer) per ECL§27-1405. Benchmark Environmental Engineering & Science, PLLC (Benchmark) in association with TurnKey Environmental Restoration, LLC (TurnKey) will manage the brownfield cleanup on behalf of the current owner Eyezon Associates, Inc. The NYSDEC Division of Environmental Remediation (Region 8), in consultation with the New York State Department of Health (NYSDOH) shall monitor the remedial actions to verify that the work is performed in accordance with the Brownfield Cleanup Agreement, the approved RA Work Plan, and NYSDEC DER-10 guidance.

2.0 PRE-REMEDIATION TASKS

2.1 Public Information and Outreach

A fact sheet containing information about the planned remedial work will be sent to those individuals on the Brownfield Site Contact List, including property owners and residents adjacent to the Site, environmental groups, local political representatives, and interested regulatory agencies. Furthermore, a copy of this Work Plan will be made available for public review at the NYSDEC Region 8 office and the Spencerport Public Library, the designated document repository.

2.2 Underground Utilities Location

The remediation contractor will contact underground facilities protection organization (Dig Safely New York, UFPO) to locate utility lines within the work area.

2.3 Health and Safety Plan Development

A Health and Safety Plan (HASP) will be prepared and enforced by the remediation contractor in accordance with the requirements of 29 CFR 1910.120. The HASP will cover all on-site remedial activities. TurnKey will be responsible for Site control and for the health and safety of its authorized site workers. TurnKey's HASP is provided for informational purposes in Appendix A. The remediation contractor will be required to develop a HASP as or more stringent than TurnKey's HASP.

2.4 Mobilization and Site Preparation

The remediation contractor's field operations at the Site will commence with mobilizing equipment and materials to the Site and erecting safety fencing and other temporary controls as described below.

A site walk will be completed in the area planned for injection to inspect the surface cover (e.g., asphalt/concrete) to inspect for former boreholes which may allow injection reagent to migrate to the surface. Any identified former boreholes will be filled with asphalt patch and/or cement.

2.5 Temporary Facilities and Controls

Temporary facilities for use during the remedial work may include a construction field trailer and portable toilets. Temporary controls will be employed for protection against off-site migration of soil and safety hazards during construction, including safety fencing, dust suppression, and erosion control as further described below.

2.5.1 *Access Controls*

Temporary safety construction fencing (i.e., 3-foot high orange plastic or 6-foot chain link) will be placed around the outer perimeter of work area(s) to distinguish the work zone and discourage trespassing.

Daily work areas will be identified with construction cones and/or snow fencing. Work areas will be determined daily based on the planned remedial activities, and may be changed throughout the work day to ensure safe operations. Access control will consider site worker and general public safety, and tenant access requirements.

2.5.2 *Material Storage*

Limited on-Site storage is planned for the remedial activities. In-Situ reagents will be brought to the site on an as needed basis, with no more than one to two days of reagent being stored on-Site. Temporary on-Site storage will be located within: the existing building; a locked mobile trailer; and/or, within 6-foot high temporary fencing enclosure. Locations of the temporary storage area will be determined on a day-by-day basis.

2.5.3 *Dust Monitoring and Controls*

A Community Air Monitoring Plan (CAMP), as more fully described in Section 4.1, will be implemented during Site excavation work. If community air monitoring indicates the need for dust suppression or if dust is visually observed leaving the Site, the remediation contractor will apply a water spray across the excavation and surrounding areas, and on Site haul roads as necessary to mitigate airborne dust formation and migration. Potable water will either be obtained from a public hydrant or provided by the on-site water service, if available.

If CAMP data indicate exceedance of VOC thresholds the contractor will be required to adjust work practices to minimize the area of soil disturbance.

2.5.4 *Erosion and Sedimentation Control*

Provisions will be made for erosion and sedimentation control at the work perimeter during remediation activities. A Master Erosion Control Plan (MECP) has been prepared and incorporated as Appendix B to this Work Plan. This MECP includes provisions for silt fencing, hay baling, mulching, and other measures as warranted.

3.0 CLEANUP APPROACH

The approved Alternatives Analysis Report and the NYSDEC February 2013 Decision Document (DD) identified the cleanup approach for the Site. Specifically, the selected remedy is a Track 4 approach (i.e., restricted use with site-specific soil cleanup objectives) incorporating the following major remedial elements:

- In-Situ direct injection of biological amendments to address areas of the Site impacted with chlorinated VOCs in groundwater
- Installation of an active subslab depressurization (ASD) system within the existing building (Active Subslab Depressurization System Work Plan, August 2010);
- Limited surface soil excavation and off-site disposal
- Maintenance and placement of a site cover system in areas without building or hardscape (i.e., asphalt, concrete).
- Development of a Site Management Plan (SMP) for post-certificate of completion (COC) operation, maintenance and monitoring.

3.1 In-Situ Groundwater Treatment

3.1.1 *Technology Description*

Enhanced Bioremediation of chlorinated VOCs in groundwater will be accomplished using 3-D Microemulsion (3DME) (also known as HRC Advanced®), a specially formulated hydrogen release compound developed by Regenesis Corporation. 3DME a slightly viscous lactic acid-based liquid that is pressure injected into saturated soils using small diameter probe rods and a high-pressure injection pump. 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 for up to four years.

Information including Regenesis 3DME® product brochure, Material Safety Data Sheet (MSDS) and application instructions are included in Appendix E. The reagent will be delivered in 275-gallon totes and 55-gallon drums to the Site. No more than one to two days of reagent will be temporarily stored on-Site at one time.

3.1.2 *Site Specific In-Situ Treatment Details*

The site-specific remedial program was developed using design software provided by Regenesis. This remedial program will involve directly injecting approximately 21,200 lbs. of 3DME into the saturated soils across the Site (see Figure 5). Any dilution of the 3DME will be field determined based on achieved application rates. Dilution make-up water will be from the municipally-supplied potable water supplier (Monroe County Water Authority).

In total, 70 injection points are planned across the Site to address groundwater impacts. Direct-push delivery probes will be advanced to approximately 25 fbgs and 3DME ® will be injected continuously at a rate of approximately 14 lbs/ft. until the delivery probe is retracted to approximately 1 feet above the saturated thickness.

3.1.3 *Groundwater Monitoring*

A groundwater sampling program will be implemented to evaluate the effectiveness of the in-situ groundwater treatment program. Groundwater sampling will be completed consistent with the approved RI Work Plan (dated April 2010) utilizing low-flow techniques. In addition to standard field measured parameters, including pH, specific conductance, dissolved oxygen, redox potential, temperature and turbidity, groundwater samples will be collected and analyzed as follows:

- Quarterly groundwater sampling will be completed to monitor the short-term effectiveness of the in-situ treatment prior to obtaining the certificate of completion (COC). Additional details of long-term groundwater monitoring will be provided in the Site Management Plan, which is a component of the Site Remedy.
- The groundwater sampling program will consist of post-treatment monitoring in 14 existing piezometers and monitoring wells. All groundwater samples will be analyzed for TCL plus CP-51 VOCs via USEPA SW-846 Method 8260. Groundwater data will be provided to the NYSDEC after each monitoring event.
- Additional analytical parameters to evaluate effectiveness of the in-situ treatment including, dissolved iron, manganese, sulfate, nitrate-nitrite, and dissolved gases including methane, ethane, and ethane, will be collected.

3.2 Limited Shallow Soil/Fill Excavation

Based on the investigation results for SS-1 and SS-3, which indicated potential exceedance of the Commercial Use SCOs for benzo(a)pyrene, a limited surface excavation of vegetated (i.e. grass covered) areas along the northern, southern and eastern property boundaries will be completed. The limited surface excavation is planned to remove the upper 12 inches of material. The proposed excavation area is presented in Figure 6. The Master Erosion Control Plan (MECP), attached in Appendix B, will be utilized during intrusive activities. As described in Section 2.5.3 above, the CAMP will be implemented during intrusive activities. The CAMP is included within the HASP (Appendix A).

3.2.1 *Off-Site Disposal*

Excavated non-hazardous soil/fill will be properly characterized and approved for disposal at a licensed commercial solid waste landfill. Excavated materials will be direct loaded into dump trucks or trailers for off-Site disposal. All excavation work will be directed by an experienced TurnKey environmental professional. Documentation, including disposal application and approval, and trucking disposal manifests will be provided in the Final Engineering Report.

3.2.2 *Soil Cover/Imported Backfill/Topsoil*

The planned shallow excavation will require 12 inches of approved clean backfill material, including approximately three inches of topsoil suitable for promoting vegetation (e.g., grass). A demarcation layer (e.g., snow fence, plastic mesh) will be installed prior to placement of the 12 inches of cover soil. Soil cover detail is provided on Figure 6.

All off-site backfill material used on-Site must meet the following criteria:

- Off-site soil will originate from known sources having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, which has been tested in accordance with DER10, 5.4(e)10, or at a reduced frequency if agreeable to the Department.

- All off-site sources of soil/fill to be used as backfill must be tested in accordance with DER-10, and found to contain concentrations less than criteria listed in Table 1 – Criteria for Use of Off-Site Soil.

- No off-site materials meeting the definition of a solid waste as defined in 6NYCRR, Part 360-1.2(a) shall be used as backfill. No on-Site reuse of excavated material is planned.

4.0 REMEDIAL ACTIVITIES SUPPORT DOCUMENTS

4.1 Health and Safety Protocols

TurnKey has prepared a Health and Safety Plan (HASP) for use by our employees in accordance with 40 CFR 300.150 of the NCP and 29 CFR 1910.120. The HASP, provided in Appendix A, includes the following site-specific information:

- A hazard assessment.
- Training requirements.
- Definition of exclusion, contaminant reduction, and other work zones.
- Monitoring procedures for Site operations.
- Safety procedures.
- Personal protective clothing and equipment requirements for various field operations.
- Disposal and decontamination procedures.

The HASP also includes a contingency plan that addresses potential site-specific emergencies, and a Community Air Monitoring Plan that describes required particulate monitoring to protect the neighboring community during intrusive site remediation activities.

Health and safety activities will be monitored throughout the remedial field activities. A member of the field team will be designated to serve as the Site Safety and Health Officer (SSHO) throughout the field program. This person will report directly to the Project Manager and the Corporate Health and Safety Coordinator. The HASP will be subject to revision as necessary, based on new information that is discovered during the field investigation and/or remedial activities.

4.1.1 *Community Air Monitoring*

Real-time community air monitoring will be performed during intrusive remedial activities at the Site. A CAMP is included with TurnKey's HASP. Particulate and VOC monitoring will be performed along the downwind perimeter of the work area during excavation, grading and soil/fill handling activities in accordance with this plan. Upwind

concentrations will be field monitored at the start and periodically throughout the work day. Monitoring locations will be evaluated throughout the work day, as described in the CAMP. The CAMP is consistent with the requirements for community air monitoring at remediation sites as established by the New York State Department of Health (NYSDOH) and NYSDEC. Accordingly, it follows procedures and practices outlined under NYSDEC's DER-10 (May 2010) Appendix 1A (NYSDOH's Generic Community Air Monitoring Plan) and Appendix 1B (Fugitive Dust and Particulate Monitoring).

4.2 Citizen Participation Activities

NYSDEC will coordinate and lead community relations throughout the course of the project with support from TurnKey as requested. A Citizen Participation (CP) Plan has been prepared by TurnKey and approved by NYSDEC. A copy of the CP Plan has been placed in the Spencerport Public Library, the designated project document repository. The NYSDEC, with input from TurnKey and Eyezon, will issue project fact sheets to keep the public informed of remedial activities.

5.0 REPORTING

5.1 Remedial Activities Reporting

TurnKey will be on-Site full-time during the remedial actions to document remedial activities. Monitoring and documentation of the RA activities will include: construction stake-out; record drawings; daily reports of activities; community air monitoring results; post-injection sampling and analysis; and progress photographs and sketches.

5.1.1 *Field Construction Monitoring*

Standard daily reporting procedures will include preparation of an Inspector's Daily Report and, when appropriate, problem identification and corrective measures reports. Appendix C contains sample project documentation forms. Information that may be included on the daily report form includes:

- Processes and locations of construction under way.
- Equipment and personnel working in the area, including subcontractors.
- Number and type of truckloads of soil/fill removed from the site.
- Approximate sampling locations (sketches) or GPS (Trimble) coordinates and sample designations for pre-excavation characterization..
- Grid locations and depths being excavated.
- Injection point locations, depth and injection interval and volume of material injected.

The completed reports will be available on-site and submitted to the NYSDEC as part of the Final Engineering Report. The NYSDEC will be promptly notified of problems requiring modifications to this Work Plan prior to proceeding or completion of the construction item.

Photo documentation of the remedial activities will be prepared by a field representative throughout the duration of the project as necessary to convey typical work activities, changed conditions, and/or special circumstances.

5.2 Final Engineering Report

A Final Engineering Report (FER) will be prepared at the conclusion of remedial activities. The FER will include the following information and documentation, consistent with the NYSDEC's DER-10 Technical Guidance for Site Remediation:

- Introduction and background.
- A Site or area planimetric map showing the parcel(s) remediated, including significant site features.
- A Site map showing the lateral limits of any excavations.
- Tabular summaries of unit quantities including: volume of soil excavated and disposition of excavated soil.
- Planimetric map showing location of all injection locations.
- Documentation on the disposition of impacted soil removed from the Site.
- Documentation of the in-Situ injection biological amendments. Injection locations and amount of biological amendments will be documented.
- Documentation on the installation of the ASD System.
- Documentation of the cover system, including survey elevations and licensed professional engineer stamped record drawings.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Photo documentation of remedial activities.
- Text describing the remedial activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the Site activities were carried out in accordance with this Work Plan.

5.3 Site Management Plan

A Site Management Plan (SMP) will be prepared for the Site that describes site-specific Institutional Controls and/or Engineering Controls (IC/EC) is a required component of the final remedy. Therefore, as part of the final remedy, an SMP will be prepared. Consistent with NYSDEC BCP requirements, components of the SMP will include:

- **Engineering and Institutional Controls Plan**. Engineering controls include any physical barrier or method employed to actively or passively contain, stabilize, or monitor contaminants; restrict the movement of contaminants; or eliminate potential exposure pathways to contaminants. Institutional controls at the site will include groundwater use restrictions and use restrictions of the Site to restricted use (i.e., residential or commercial purposes).
- **Operation and Maintenance Plan** that describes the measures necessary to operate, monitor, and maintain the mechanical components of the Sub-Slab Depressurization System.
- **Excavation Work Plan** to assure that future intrusive activities and soil/fill handling at the Site are completed in a safe and environmentally responsible manner.
- **Site Monitoring Plan** that includes: provisions for a groundwater monitoring plan and a Site-wide inspection program to assure that the IC/ECs have not been altered and remain effective.
- **Environmental Easement** filed with Monroe County.

6.0 PROJECT SCHEDULE

The anticipated project schedule for the major tasks to be performed during implementation of the Remedial Action Work Plan is included as Figure 7. Major tasks are planned as follows:

- *Winter/Spring 2014* – Complete installation of ASD System in existing building
- *Spring/Summer 2014* – Complete remedial injection program, post-injection groundwater sampling and shallow soil excavation
- *Summer/Fall 2014* – Submit Draft Site Management Plan (SMP) and Final Engineering Report (FER)
- *Fall/Winter 2014* – Submit Final SMP and FER
- *Winter 2014* – Receive Certificate of Completion (COC)

7.0 REFERENCES

1. Haley & Aldrich, of New York, *Phase I/II Environmental Site Assessment Report*, 500 Union Street, Spencerport, NY, prepared for Rite Aid Corporation, November 1998.

2. TurnKey Environmental Restoration, LLC, *Phase I Environmental Site Assessment Report*, 500 Union Street, Spencerport, NY. April 2008.

3. TurnKey Environmental Restoration, LLC, *Phase II Site Investigation Report*, 500 South Union Street Site, Spencerport, NY. April 2008.

4. TurnKey Environmental Restoration, LLC, *Additional Subsurface Investigation Letter Report*, 500 South Union Street Site, Spencerport, NY. July 10, 2008.

5. Empire Geo-Services, Inc., *Geotechnical Engineering Report for Proposed Rite Aid Pharmacy*, Nichols Road and South Union Street, Spencerport, NY. October 2008.

6. New York State Department of Environmental Conservation. *DER-10; Technical Guidance for Site Investigation and Remediation.* May 2010.

7. TurnKey Environmental Restoration, LLC, *Active Subslab Depressurization System Work Plan*, 500 South Union Street Site, Spencerport, NY, prepared for Eyezon Associates, Inc. Revised August 2010.

8. TurnKey Environmental Restoration, LLC, in association with Benchmark Environmental Engineering & Science, PLLC, *Remedial Investigation/Alternative Analysis Report (RI/AAR) Report*, 500 South Union Street Site, Spencerport, NY, prepared for Eyezon Associates, Inc. Revised November 2012.

TABLE

TABLE 1

REMEDIAL ACTION WORK PLAN

CRITERIA FOR IMPORTED SOIL-FILL

500 SOUTH UNION STREET SITE

SPENCERPORT, NEW YORK

Parameter	Allowable Concentration of Imported Soil/Fill [1]
Volatile Organic Compounds (mg/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	1.2
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

TABLE 1

REMEDIAL ACTION WORK PLAN

CRITERIA FOR IMPORTED SOIL-FILL

500 SOUTH UNION STREET SITE

SPENCERPORT, NEW YORK

Parameter	Allowable Concentration of Imported Soil/Fill [1]
Volatile Organic Compounds (mg/Kg)	
Trimethylbenzene-1,2,4	3.6
Trimethylbenzene-1,3,5	8.4
Vinyl chloride	0.02
Xylene (mixed)	1.6
Semi-Volatile Organic Compounds (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

TABLE 1

REMEDIAL ACTION WORK PLAN

CRITERIA FOR IMPORTED SOIL-FILL

500 SOUTH UNION STREET SITE

SPENCERPORT, NEW YORK

Parameter	Allowable Concentration of Imported Soil/Fill [1]
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

TABLE 1

REMEDIAL ACTION WORK PLAN

CRITERIA FOR IMPORTED SOIL-FILL

500 SOUTH UNION STREET SITE

SPENCERPORT, NEW YORK

Parameter	Allowable Concentration of Imported Soil/Fill [1]
PCBs/Pesticides (mg/Kg)	
Endosulfan II	102
Endosulfan sulfate	200
Endrin	0.06
Heptachlor	0.38
Lindane	0.1
Polychlorinated biphenyls	1

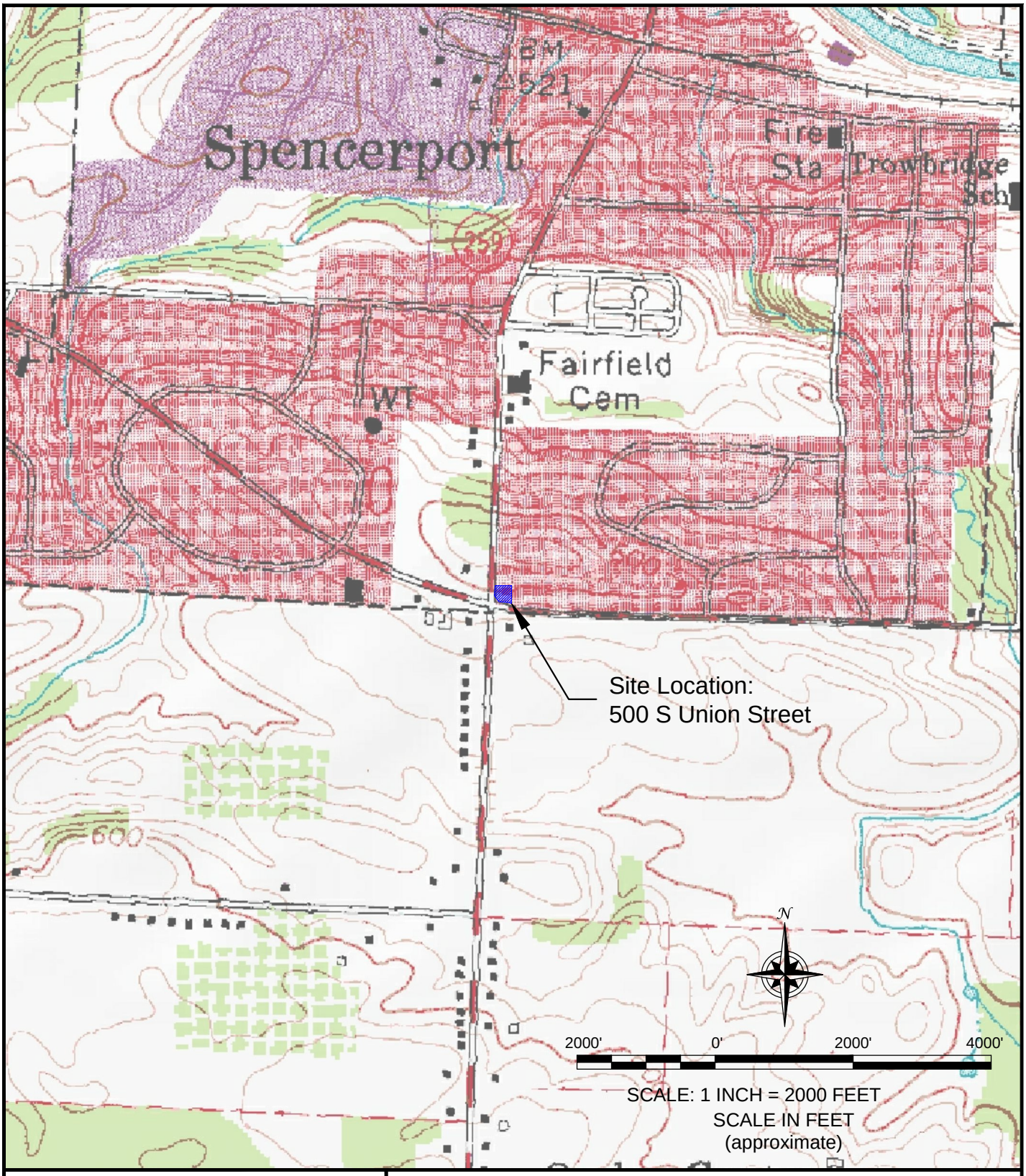
Notes:

1) Values per DER-10 Appendix 5 for Commercial Use.

FIGURES

F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 1; Site Location and Vicinity Map.dwg

FIGURE 1



TurnKey Environmental Restoration, LLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013

DRAFTED BY: JCT

SITE LOCATION AND VICINITY MAP

REMEDIAL ACTION WORK PLAN

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

PREPARED FOR

EYEZON ASSOCIATES, INC.

F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 2; Aerial Site Plan.dwg

FIGURE 2

LEGEND:

BROWNFIELD CLEANUP PROGRAM BOUNDARY

PARCEL BOUNDARY

N

50' 0' 50' 100'

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013

DRAFTED BY: JCT

SITE PLAN (AERIAL)

REMEDIAL ACTION WORK PLAN

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

PREPARED FOR

EYEZON ASSOCIATES, INC.

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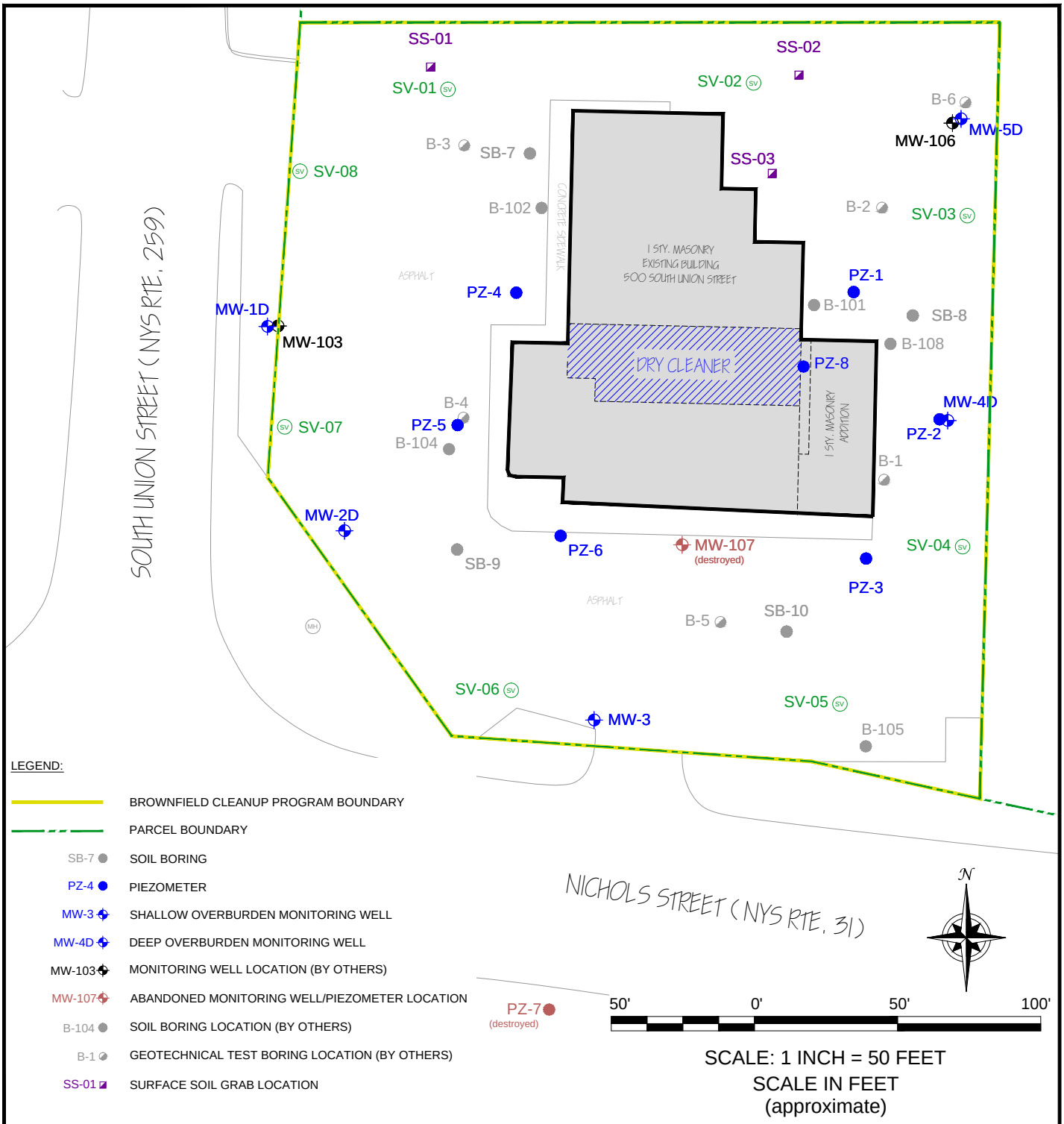
F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 3; Sample Locations.dwg

FIGURE 3



LEGEND:

- BROWNFIELD CLEANUP PROGRAM BOUNDARY
- PARCEL BOUNDARY
- SB-7 — SOIL BORING
- PZ-4 — PIEZOMETER
- MW-3 — SHALLOW OVERBURDEN MONITORING WELL
- MW-4D — DEEP OVERBURDEN MONITORING WELL
- MW-103 — MONITORING WELL LOCATION (BY OTHERS)
- MW-107 — ABANDONED MONITORING WELL/PIEZOMETER LOCATION
- B-104 — SOIL BORING LOCATION (BY OTHERS)
- B-1 — GEOTECHNICAL TEST BORING LOCATION (BY OTHERS)
- SS-01 — SURFACE SOIL GRAB LOCATION

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013

DRAFTED BY: JCT

HISTORIC & REMEDIAL INVESTIGATION SAMPLE LOCATIONS

REMEDIAL ACTION WORK PLAN

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

PREPARED FOR

EYEZON ASSOCIATES, INC.

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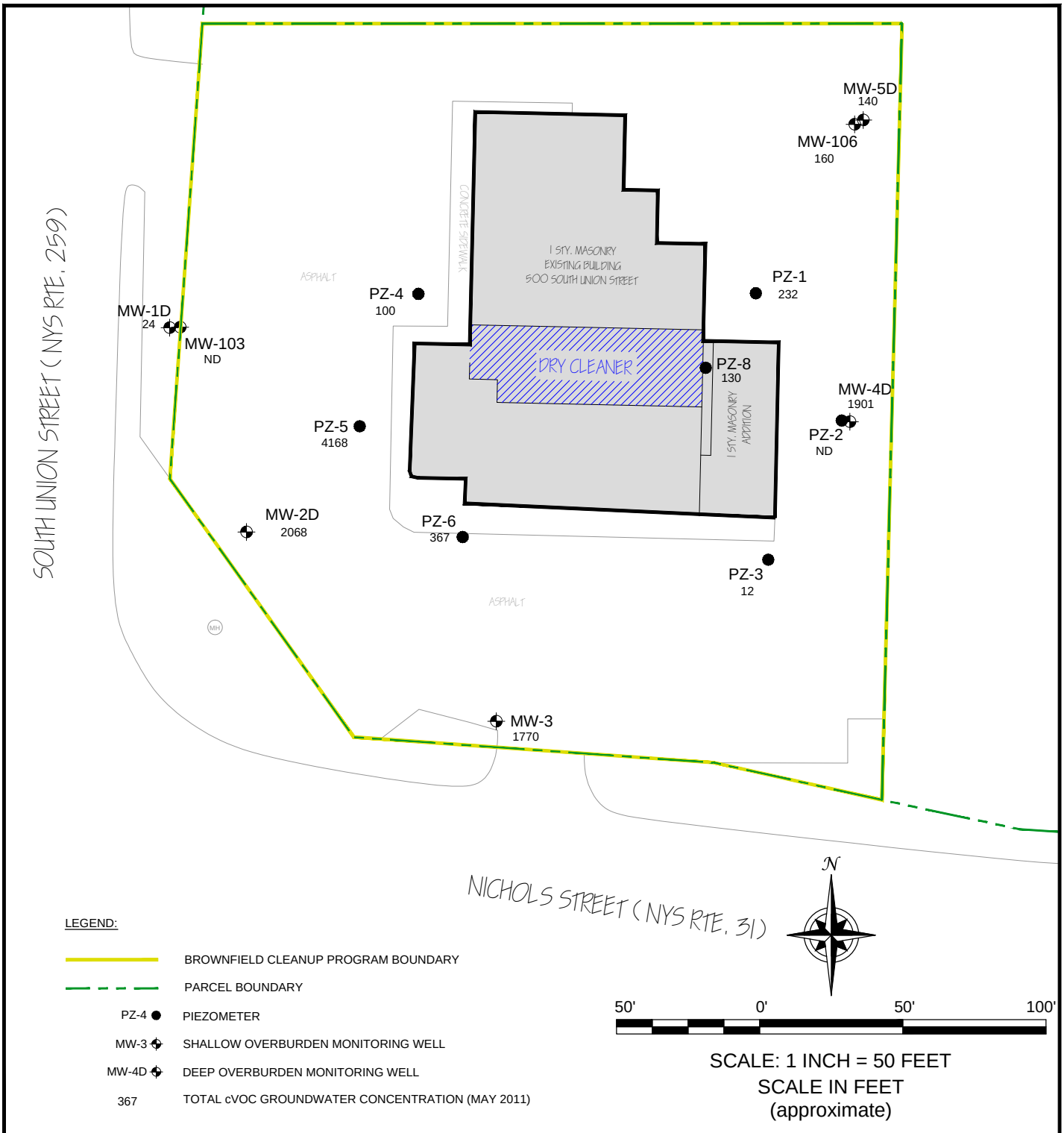
F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 4; cVOC Concentration Map.dwg

FIGURE 4



LEGEND:

- BROWNFIELD CLEANUP PROGRAM BOUNDARY
- PARCEL BOUNDARY
- PZ-4 ● PIEZOMETER
- MW-3 ⊕ SHALLOW OVERBURDEN MONITORING WELL
- MW-4D ⊕ DEEP OVERBURDEN MONITORING WELL
- 367 TOTAL cVOC GROUNDWATER CONCENTRATION (MAY 2011)

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013 (REV. MARCH 2014)

DRAFTED BY: JCT

TOTAL cVOC CONCENTRATIONS

REMEDIAL ACTION WORK PLAN

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

PREPARED FOR

EYEZON ASSOCIATES, INC.

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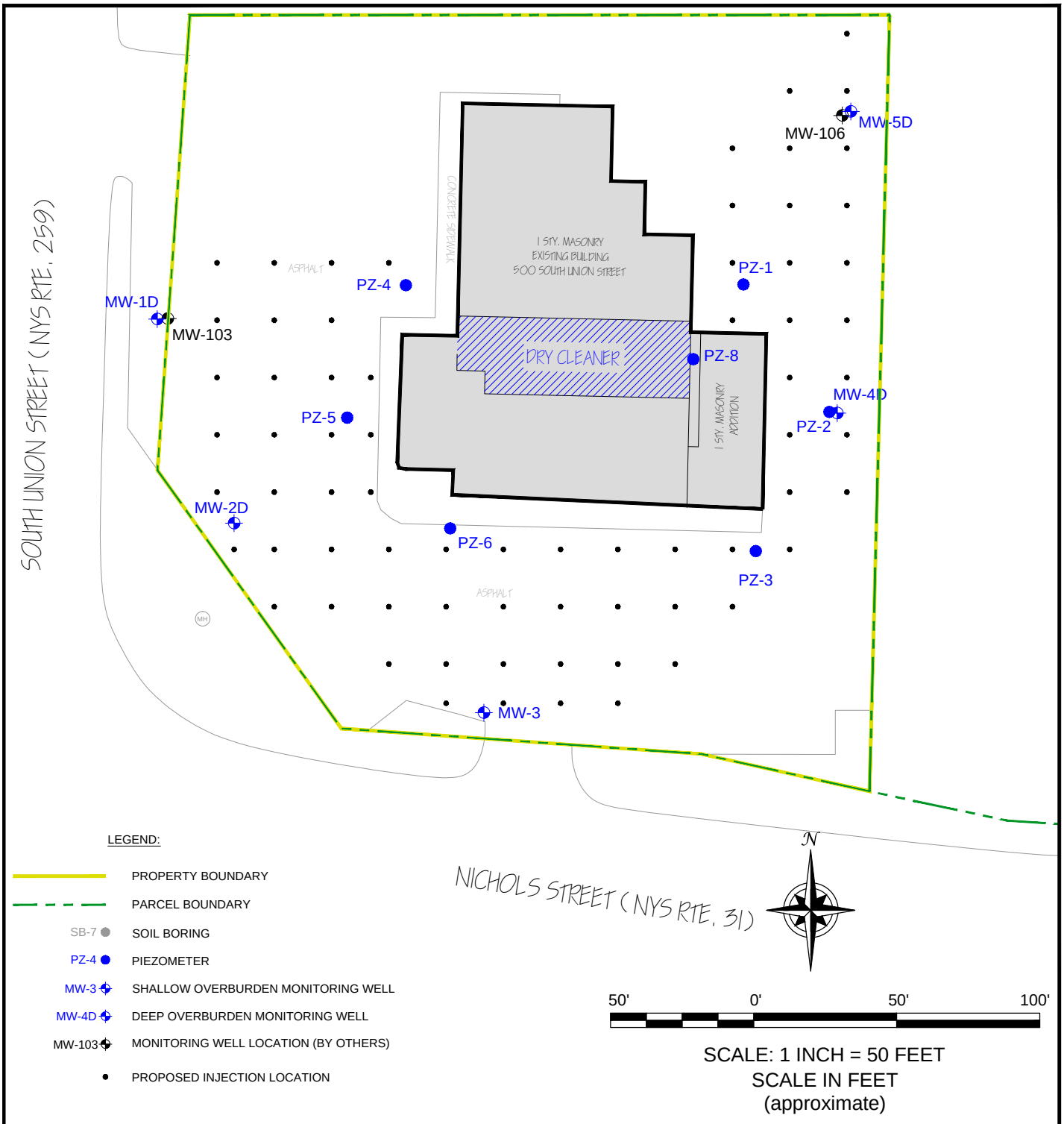
F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 5; Injection Location.dwg

FIGURE 5



LEGEND:

- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- SB-7 SOIL BORING
- PZ-4 PIEZOMETER
- MW-3 SHALLOW OVERBURDEN MONITORING WELL
- MW-4D DEEP OVERBURDEN MONITORING WELL
- MW-103 MONITORING WELL LOCATION (BY OTHERS)
- PROPOSED INJECTION LOCATION

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013

DRAFTED BY: JCT

PLANNED INJECTION POINT LOCATIONS

REMEDIAL ACTION WORK PLAN

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

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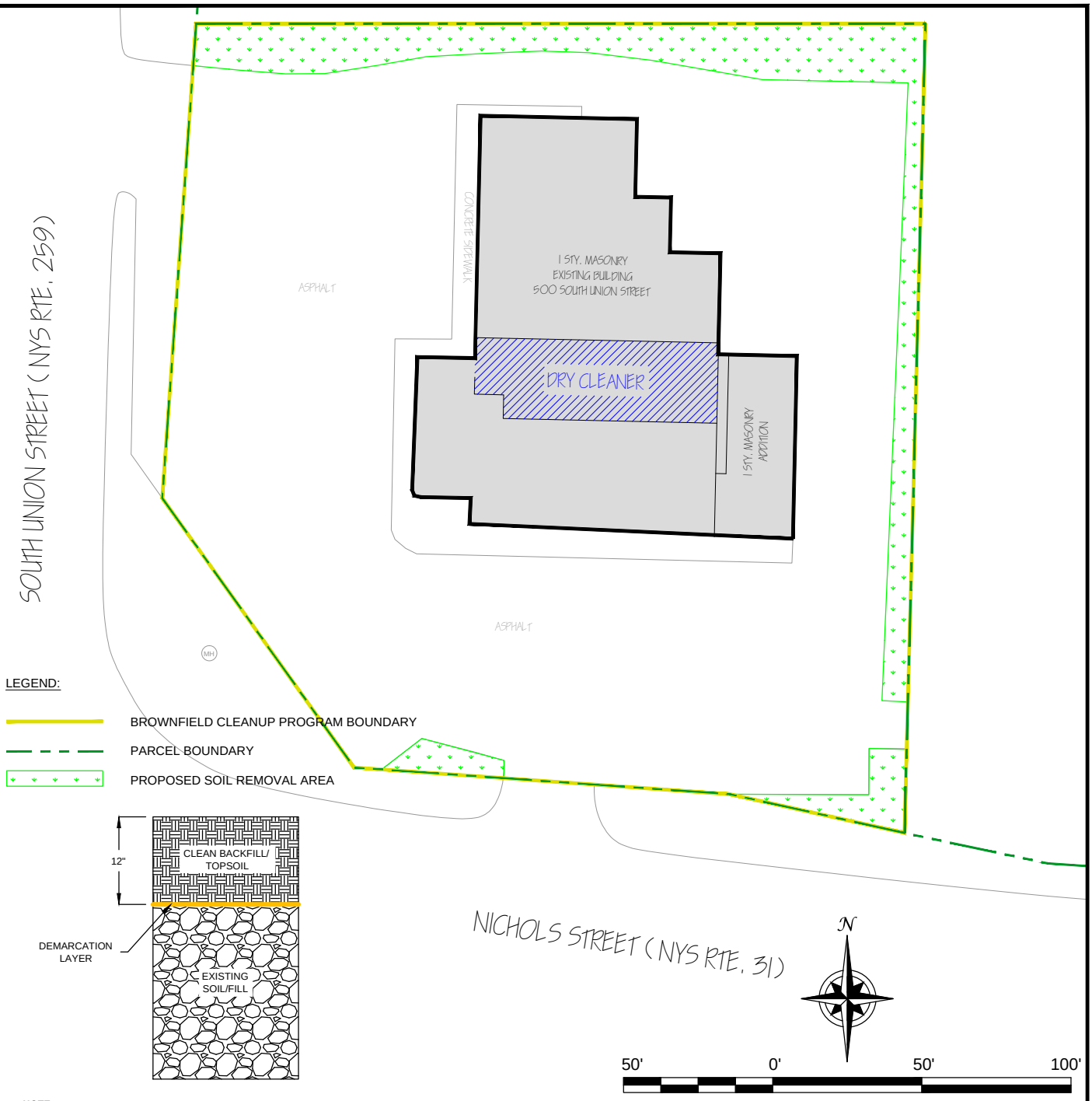
F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 6; Limited Soil Excavation.dwg

FIGURE 6



NOTE
1) THE TOP 3" OF THE CLEAN BACKFILL/TOPSOIL MUST BE SUITABLE FOR A VEGETATED COVER

SOIL COVER DETAIL

SCALE: 1 INCH = 50 FEET
SCALE IN FEET
(approximate)

TurnKey Environmental Restoration, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013

DRAFTED BY: JCT

LIMITED EXCAVATION/SOIL REMOVAL PLAN

REMEDIAL ACTION WORK PLAN

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

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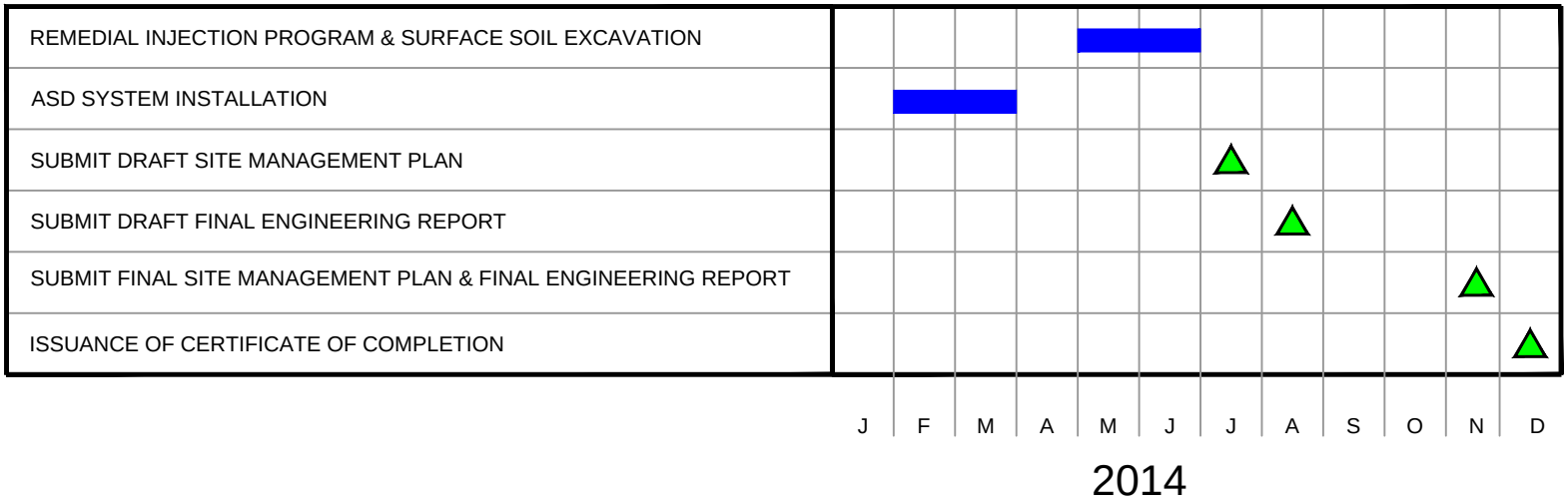
F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure 7; Project Schedule.dwg

PROJECT TASKS:



TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013 (REV. MARCH 2014)

DRAFTED BY: JCT

PROJECT SCHEDULE

REMEDIAL ACTION WORK PLAN

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

PREPARED FOR

EYEZON ASSOCIATES, INC.

FIGURE 7

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APPENDIX A

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN
for
REMEDIAL ACTION WORK PLAN

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

revised March 2014 0188-013-001

Prepared for:

Eyezon Associates, Inc.

Prepared By:

TurnKey Environmental Restoration, LLC

In Association With

Benchmark Environmental Engineering & Science, PLLC

HEALTH AND SAFETY PLAN FOR REMEDIAL INVESTIGATION ACTIVITIES

500 South Union Street Site
BCP Site No. C828153

Acknowledgement Page

Plan Reviewed by (initial):

Corporate Health and Safety Director: _____

Project Manager: _____

Designated Site Safety and Health Officer: _____

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

HEALTH AND SAFETY PLAN FOR REMEDIAL INVESTIGATION ACTIVITIES

500 South Union Street Site
BCP Site No. C828153

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Table of Contents

LIST OF TABLES

APPENDICES

1.0 INTRODUCTION

1.1 General

In accordance with OSHA requirements contained in 29 CFR 1910.120 and USEPA Standard Operating Safety Guidelines, 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) during remedial activities at the 500 South Union Street Site located in the Town of Ogden, Village of Spencerport, Monroe County, New York (S.B.L# 087.17-1-61) (see Figure 1 of the Remedial Action Work Plan). This HASP presents information and procedures for TurnKey employees who will be involved with field activities, including the assignment of responsibilities, personnel protection requirements, work practices and emergency response procedures. It is not intended to cover the activities of other contractors or subcontractors on the Site; these firms will be required to develop and enforce their own HASPs as discussed below. In order to ensure that proper coordination on such key issues as emergency notification and decontamination exists between TurnKey and other contractors or subcontractors, TurnKey will review all HASPs and coordinate procedures where appropriate.

This HASP presents information on known Site health and safety hazards using available historical information for previously investigated areas of the Site, and identify 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. This HASP will be updated as new site data becomes available.

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

1.2 Site Location and Description

The Site, currently owned by Eyezon Associates, Inc., is bound 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.

1.3 Site History

According to Phase I Environmental Site Assessments (ESAs) prepared in 1998 and 2008, the Site was historically used agriculturally as an orchard through the 1930s. A portion of the existing structure was constructed in the 1940s and used as a button factory. In the early 1970s, the Site was used as a dry cleaning facility as well as a hair salon and restaurant. During that time, an addition was added to the building. In 1989, a second addition was added to the building completing the present day structure.

Prior to 1986, spent filters from the dry-cleaning unit were disposed in dumpsters located outside the building on the eastern portion of the Site. Subsurface investigations completed in 1998 and 2008 identified the presence of chlorinated volatile organic compounds (cVOCs), specifically tetrachloroethene (PCE) and its chemical breakdown products, in soil and groundwater on-site. PCE is a common dry-cleaning solvent that was historically used on-site. The distribution of PCE and other chlorinated VOCs in groundwater suggests that on-site contamination originated from the location of the dumpster into which spent dry cleaning filters were disposed until 1986.

1.4 Previous Investigations

A Focused Phase I/II ESA Report was completed by Haley & Aldrich of New York (H&A) in November 1998. The Phase I ESA findings included 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 east of the building. The Phase II study identified elevated concentrations of cVOCs, specifically PCE and trichloroethene (TCE) 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 in general agreement with the November 1998 Phase I ESA. Phase II analytical results indicate the presence cVOC analytes related to dry-cleaning operations (i.e., PCE and its chemical breakdown products). The concentrations of cVOC in each of the six piezometers were above the New York State Department of Environmental Conservation (NYSDEC) Groundwater Quality Standards (GWQS).

TurnKey conducted an Additional Subsurface Investigation at the 500 South Union Street Site in July 2008. This investigation included completion of one soil boring, installation and sampling of one new piezometer off-site, and sampling of one existing groundwater monitoring well on-site. The groundwater samples indicated the presence of PCE in the on-site well and cis-1,2-dichloroethene (cis-1,2-DCE) in the off-site piezometer above NYSDEC GWQS.

In September 2010, TurnKey installed five monitoring wells and one piezometer on the Site as a component of a Remedial Investigation (RI) of the Site. The existing and newly wells and piezometers were sampled in September 2010 and May 2011. The RI identified that cVOCs are the primary constituents of Concern (COC) in groundwater with PCE and/or its chemical breakdown products, TCE and cis-1,2-DCE, and vinyl chloride (VC) detected above GWQS in several piezometers and monitoring wells on-Site.

1.5 Remedial Activities

TurnKey personnel will be on-site for remedial activities including the following:

- Groundwater treatment via enhanced in-situ reductive dechlorination of cVOCs in groundwater.
- Excavation of the top 12-inches of soil in the vegetated areas along the northern, eastern, and southern property lines.

2.0 ORGANIZATIONAL STRUCTURE

This chapter 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 chapter is to identify the personnel who will impact the development and implementation of the HASP and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations and it establishes the lines of communication among them for health and safety matters. The organizational structure described in this chapter 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 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 Corporate Health and Safety Director is **Mr. Thomas H. Forbes, P.E**. The Corporate Health and Safety Director is responsible for developing and implementing the Health and Safety program and policies for Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC, 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'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 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 Remedial Action Work Plan.
- Providing TurnKey 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 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 H. 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 work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

- Managing the safety and health functions for TurnKey personnel on the Site.
- Serving as the point of contact for safety and health matters.
- Ensuring that TurnKey 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 personal protective equipment (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 with health and safety responsibilities in the work zone, including subcontractors and governmental agencies performing Site inspection work (i.e., NYSDEC and/or its designated oversight contractor) who will be responsible for developing, implementing, and enforcing a Health and Safety Plan equally stringent or more stringent than TurnKey's HASP. TurnKey assumes no responsibility for the health and safety of anyone outside its direct employ. During activities involving subcontractors, the subcontractor's HASP shall cover all non-TurnKey Site personnel. The subcontractor(s) shall assign a SSHO who will coordinate with TurnKey's SSHO as necessary to ensure effective lines of communication and consistency between health and safety plans.

3.0 HAZARD EVALUATION

The possibility exists that workers will be exposed to hazardous substances during the remedial activities listed in Section 1.5. The principal points of exposure would be through direct contact with impacted media or vapors during intrusive activities. In addition, the use of large equipment will also present conditions for potential physical injury to workers. 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. As additional data is obtained, Tables 1 and 2 will be updated accordingly. Brief descriptions of the toxicology of these materials and related health and safety guidance and criteria are provided below.

- **Tetrachloroethene (PCE)** was formally 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 formally 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.

- **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 acne-type blemishes in areas of the skin exposed to sunlight.

With respect to the anticipated activities defined in Section 1.4, 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 and on Table 4, will minimize the potential for exposure to airborne contamination. Further, 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

Remedial activities at the Site may present the following physical hazards:

- The potential for physical injury during heavy equipment use, such as drill rigs.
- The potential for slip and fall injuries due to slippery terrain.

These hazards represent only some of the possible means of injury that may be present during investigation and sampling 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. A few common hazards are presented in the

following sections; project specific hazards should always be discussed with the Project Manager prior to beginning any field project.

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 will be 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.

4.0 TRAINING

4.1 Site Workers

All personnel performing remedial activities (such as, but not limited to, equipment operators and general laborers) 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.
- 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'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 surveillance, including recognition of symptoms and signs of over-exposure (see Section 5).
- Decontamination procedures (see Section 12).
- The Emergency Response Plan (see HASP Appendix A-1).
- Confined space entry procedures, if required (see Section 13).
- The spill containment program (see Section 9).
- Site control (see Section 11).

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 on-going Site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include, but are not limited to: a change in Site conditions (i.e., 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, 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 discussed in the Emergency Response Plan (Appendix A-1 of this HASP).

4.4 Site Visitors

TurnKey's SSHO will provide a site-specific briefing to all Site visitors and other non-TurnKey personnel who enter the Site beyond the Site entry point. The site-specific briefing will provide information about Site hazards, the Site lay-out 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 employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment and termination physicals for all TurnKey employees involved in hazardous waste Site field operations. Annual exams are provided for those employees who are engaged in hazardous waste site field operations for more than 30 days per year, or who meet other specific criteria listed in 29 CFR 1910.120(f). 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 an occupational health care provider under contract with Benchmark-TurnKey. Health Works WNY, Seneca Square Plaza, 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050.

Medical evaluations are conducted according to the Benchmark-TurnKey Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. 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.

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.

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

6.0 SAFE WORK PRACTICES

All TurnKey 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.
- Due to possible contraindications, use of prescribed drugs should be reviewed with the TurnKey occupational physician.
- Alcoholic beverage and illegal drug intake are strictly forbidden during the work day.
- 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 employees, as requested and required.

The recommended specific safety practices for working around the subcontractor's equipment (e.g., drill rig, site truck.) are as follows:

- Although the subcontractors are responsible for their equipment and safe operation of the Site, TurnKey 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.
- Investigation 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 investigation activity when not immediately involved in sampling/logging/observing activities.
- Personnel will not approach the edge of an unsecured trench/excavation closer than two 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. Table 4 listed the required PPE for each remedial investigation activity.

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. The following 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 (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 self-contained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totally encapsulating chemical resistant suit. Level B incorporates hooded one-or two-piece 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 are 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 proposed work activities at the Site, the possibility exists that organic vapors and/or particulates may be released to the air during intrusive construction activities. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PELs) established by OSHA for the individual compounds (see Table 1), 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-Benchmark 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). Observed values will be recorded and maintained as part of the permanent field record.

8.1.2 **Off-Site Community Air Monitoring**

In addition to on-site monitoring within the work zone(s), monitoring at the down-wind portion of the Site perimeter will be conducted. 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 Community Air Monitoring Plan, which is attached in HASP Appendix A-2. Ground intrusive activities 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-Benchmark personnel to monitor organic vapor concentrations as specified in this HASP. In addition, fugitive dust/particulate concentrations will be monitored during major soil intrusion (viz., well/boring installation) using a real-time particulate monitor as specified in this plan. 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 ppm above background on the 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 - 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 may be used to monitor levels of both combustible gases and oxygen during RI/IRM activities. Action levels based on the instrument readings shall be as follows:

- Less than 10% 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 mg/m^3 - Continue field operations.
- 50-150 mg/m^3 - Don dust/particulate mask or equivalent
- Greater than 150 mg/m^3 - Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (viz., wetting of excavated soils or tools at discretion of Site Health and Safety 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 calibrated before use on a daily basis 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 TurnKey-Benchmark personnel on-site, the following criteria shall also be adhered to for the protection of downwind receptors consistent with NYSDOH requirements (HASP Appendix A-2):

- **ORGANIC VAPOR PERIMETER MONITORING:**
  - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the sustained organic vapor decreases below 5 ppm over background, work activities can resume but more frequent intervals of monitoring, as directed by the Site Health and Safety Officer, must be conducted.

  - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone are greater than 5 ppm over background but less than 25 ppm for the 15-minute average, activities can resume provided that: the organic vapor level 200 feet downwind of the working site or half the distance to the nearest off-site residential or commercial structure, whichever is less, is below 5 ppm over background; and more frequent intervals of monitoring, as directed by the Site Health and Safety Officer, are conducted.

  - If the sustained organic vapor level is above 25 ppm at the perimeter of the exclusion zone for the 15-minute average, the Site Health and Safety Officer must be notified and work activities shut down. The Site Health and Safety Officer will determine when re-entry of the exclusion zone is possible and will implement downwind air monitoring to ensure vapor emissions do not impact the nearest off-site residential or commercial structure at levels exceeding those specified in the ***Organic Vapor Contingency Monitoring Plan*** below. All readings will be recorded and will be available for New York State Department of Environmental Conservation (DEC) and Department of Health (DOH) personnel to review.

- **ORGANIC VAPOR CONTINGENCY MONITORING PLAN:**
  - If the sustained organic vapor level is greater than 5 ppm over background 200 feet downwind from the work area or half the distance to the nearest off-site residential or commercial property, whichever is less, all work activities must be halted.

  - If, following the cessation of the work activities or as the result of an emergency, sustained organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest off-site residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest off-site residential or commercial structure (20-foot zone).

- If efforts to abate the emission source are unsuccessful and if sustained organic vapor levels approach or exceed 5 ppm above background within the 20-foot zone for more than 30 minutes, or are sustained at levels greater than 10 ppm above background for longer than one minute, then the ***Major Vapor Emission Response Plan*** (see below) will automatically be placed into effect.

o **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. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two sustained successive readings below action levels are measured, air monitoring may be halted or modified by the Site Health and Safety Officer.

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	State Emergency Response Hotline	(800) 457-7362

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

o **EXPLOSIVE VAPORS:**

- Sustained atmospheric concentrations of greater than 10% LEL in the work area - Initiate combustible gas monitoring at the downwind portion of the Site perimeter.

- Sustained 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/m^3) greater than the background (upwind perimeter) 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/m^3 above the upwind 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/m^3 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/m^3 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).

9.0 SPILL RELEASE/RESPONSE

This chapter 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, counter-measures 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, Attachment 1, 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 non-petroleum-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 of 1,000 gallons or more, or lesser quantities that either 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 1100 gallons or greater.

The evaluation indicates that, based on Site history and the scope of work, a hazardous material spill is not likely to occur during investigation efforts. However, the procedures identified below will be followed in the event of an unanticipated release.

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 who will in turn notify NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies 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, TurnKey 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 (USEPA 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 (in order of preference) 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

Although it is anticipated that work activities at the Site will be completed during the winter months, measures to be taken to minimize heat stress to TurnKey employees have also been included in the event that work activities extend to the spring months. The SSHO and/or his or her designee will be responsible for monitoring TurnKey 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 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) **Frostnip** - 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 Frostnip.

  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 Frostnip.

- **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 SSHO 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 SITE CONTROL

The purpose of site control is to minimize potential contamination of workers, protect the public from site hazards, and prevent vandalism. The degree of site control necessary depends on the site characteristics, site size, and the surrounding community.

Controlled work areas will be established at each work location, and if required, will be established directly prior to the work being conducted. Diagrams designating specific controlled work areas will be drawn on site maps posted in the support vehicle or trailer (if applicable) and discussed during daily tailgate safety meetings. If the site layout changes, the new areas and their potential hazards will be discussed immediately after the changes are made. General examples of zone layouts have been developed for drilling and earth moving activities (e.g., excavating, trenching, etc.) and are attached to this section.

11.1 Controlled Work Zones

Controlled work zones around the areas designated for investigation activities will be established by TurnKey on a daily basis and communicated to all employees and other Site users by the SSHO. It shall be the SSHO'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 an Exclusion Zone (or contaminated work area), a Contaminant Reduction Zone (or decontamination zone), and a Support Zone (uncontaminated or "clean area" where personnel should not be exposed to hazardous conditions). Each zone will be periodically monitored in accordance with the air monitoring requirements established in this HASP. The Exclusion Zone and the Contamination Reduction Zone are considered work areas. The Support Zone is accessible to the public (e.g., vendors, inspectors). The following sections describe these zones in more detail.

11.2 Exclusion Zone

The Exclusion Zone (or "Hot Zone") is 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 clearly delineated by hazard flagging tape, barricades or cones, or enclosed by fences or ropes, as necessary. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.

The extent of each area will be sufficient to ensure that personnel located at/beyond its boundaries will not be affected in any substantial way by hazards associated with sample

collection activities. To meet this requirement, the following minimum distances will be used:

- **Direct Push Drilling Activities**. A distance of 20 feet in all directions will be cleared from the rig.
- **HSA Drilling**. Determine the mast height of the drill rig. This height will be cleared, if practical, in all directions from the bore-hole location and designated as the exclusion zone. The cleared area will be sufficient to accommodate movement of necessary equipment and the stockpiling of spoils piles.
- **Test Pitting Activities**. A distance of 25 feet will be cleared in all directions from the backhoe and the location where the excavated soil is deposited.
- **Slab Cutting**. A distance of 10 feet in all directions from the cutting location will be cleared when using manual methods (i.e., chisel or equivalent) and 20 feet when using a concrete saw.
- **Hand Augering**. A distance of 10 feet will be cleared in all directions from the sampling location in order to accommodate additional sampling equipment.

All personnel should be alert to prevent unauthorized, accidental entrance into controlled-access areas (the Exclusion Zone and CRZ). If such an entry should occur, the trespasser should be immediately escorted outside the area, or all HAZWOPER-related work must cease. All personnel, equipment, and supplies that enter controlled-access areas must be decontaminated or containerized as waste prior to leaving (through the CRZ only).

11.3 Contamination Reduction Zone (CRZ)

The Contamination Reduction Zone (CRZ) is the transition area between the contaminated area and the clean area. Decontamination is the main focus in this area. The decontamination of workers and equipment limits the physical transfer of hazardous substances into the clean area. This area must also be clearly marked with hazard tape and access limited to personnel involved in decontamination, as necessary.

11.4 Support Zone

The Support Zone is an uncontaminated zone where administrative and other support functions, such as first aid, equipment supply, emergency information, etc., are

located. The Support Zone shall have minimal potential for significant exposure to contaminants (i.e., background levels). Employees will establish a Support Zone (if necessary) at the site before the commencement of site activities. The Support Zone would also serve as the entry point for controlling site access. Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

11.5 Boundaries

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

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

11.6 Site Access Documentation

Access of non-essential personnel to the Exclusion and Contaminant Reduction Zones will be strictly controlled by TurnKey. Only personnel who are essential to the completion of the task will be allowed access to these areas with the prescribed level of protection. Entrance of all personnel must be approved by the SSHO. If implemented by the PM, all personnel entering the site shall complete a "Site Entry/Exit Log" located at the site trailer or primary site support vehicle.

The Contractor will maintain a Health and Safety Logbook containing the names of 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.

11.7 Visitor Access

Visitors to any HAZWOPER controlled-work area must comply with the health and safety requirements of this HASP, and demonstrate an acceptable need for entry into the work area. All visitors desiring to enter any controlled work area must observe the following procedures:

1. A written confirmation must be received by TurnKey documenting that each of the visitors has received the proper training and medical monitoring required by this HASP. Verbal confirmation can be considered acceptable provided such confirmation is made by an officer or other authorized representative of the visitor's organization.

2. Each visitor will be briefed on the hazards associated with the site activities being performed and acknowledge receipt of this briefing by signing the appropriate tailgate safety briefing form.

3. All visitors must be escorted by an TurnKey employee.

If the site visitor requires entry to any Exclusion Zone, but does not comply with the above requirements, all work activities within the Exclusion Zone must be suspended. Until these requirements have been met, entry will not be permitted.

11.8 Site Security

Site security is necessary to:

- Prevent the exposure of unauthorized, unprotected people to site hazards.
- Avoid the increased hazards from vandals or persons seeking to abandon other wastes on the site.
- Prevent theft.
- Avoid interference with safe working procedures.

To maintain site security during working hours:

1. Maintain security in the Support Zone and at access control points.

2. Establish an identification system to identify authorized persons and limitations to their approved activities.

3. Assign responsibility for enforcing authority for entry and exit requirements.

4. When feasible, install fencing or other physical barrier around the site.

5. If the site is not fenced, post signs around the perimeter and whenever possible, use guards to patrol the perimeter. Guards must be fully apprised of the hazards involved and trained in emergency procedures.

6. Have the PM approve all visitors to the site. Make sure they have valid purpose for entering the site. Have trained site personnel accompany visitors at all times and provide them with the appropriate protective equipment.

To maintain site security during off-duty hours:

1. If possible, assign trained, in-house technicians for site surveillance. They will be familiar with the site, the nature of the work, the site's hazards, and respiratory protection techniques.

2. If necessary, use security guards to patrol the site boundary. Such personnel may be less expensive than trained technicians, but will be more difficult to train in safety procedures and will be less confident in reacting to problems around hazardous substances.

3. Enlist public enforcement agencies, such as the local police department, if the site presents a significant risk to local health and safety.

4. Secure the equipment.

12.0 DECONTAMINATION

12.1 Decontamination for TurnKey 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 which may arise at the Site. All TurnKey personnel on-site shall follow the procedure below.

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.

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 duration of 6 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 subcontractor in accordance with his approved HASP in the Contamination Reduction Zone. As a minimum, this will include manually removing heavy soil clods, followed by high pressure water and detergent or steam cleaning.

Decontamination of all tools used for sample collection purposes will be conducted by TurnKey personnel. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal) that 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.

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 employees is not anticipated to be necessary to complete the remedial activities identified in Section 1.4. In 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 employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed and a confined-space entry permit will be issued through TurnKey's corporate Health and Safety Director. TurnKey employees shall not enter a confined space without these procedures, permits in place, and proper training.

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 TurnKey and are required to be provided by the subcontractor on all heavy equipment brought on-site. 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 (portable or stationary) that are 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 blow torch operation, the hot work permit presented in Appendix A-3 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 included as Appendix A-1 of this HASP.

16.0 REFERENCES

1. Haley & Aldrich, of New York, *Phase I/II Environmental Site Assessment Report*, 500 Union Street, Spencerport, NY, prepared for Rite Aid Corporation, November 1998.

2. TurnKey Environmental Restoration, LLC, *Phase I Environmental Site Assessment Report*, 500 Union Street, Spencerport, NY, prepared for 1093 Group, LLC, April 2008.

3. TurnKey Environmental Restoration, LLC, *Phase II Site Investigation Report*, 500 South Union Street Site, Spencerport, NY, prepared for 1093 Group, LLC, April 2008.

4. TurnKey Environmental Restoration, LLC, *Additional Subsurface Investigation Letter Report*, 500 South Union Street Site, Spencerport, NY, prepared for Ellicott Development Company, July 10, 2008.

5. TurnKey Environmental Restoration, LLC, *Final Remedial Investigation/Alternatives Analysis Report*, 500 South Union Street Site, Spencerport, NY, prepared for Eyezon Associates, Inc., November 2012.

TABLES

TABLE 1

COPCs & OBSERVED CONCENTRATIONS BY MEDIA

Health and Safety Plan for Remedial Action Activities
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.

TABLE 2

TOXICITY AND EXPOSURE DATA FOR CONSTITUENTS OF POTENTIAL CONCERN

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

Constituents of Potential Concern	Inhalation Hazard		IDLH
	PEL	TLV	
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	Ca
Semi-Volatile Organic Compounds (ppm):			
Benzene	1	0.5	500, Ca
Ethylbenzene	100	20	800
Xylene	100	100	900

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.

TABLE 3

POTENTIAL ROUTES OF EXPOSURE TO CONSTITUENTS OF POTENTIAL CONCERN

Health and Safety Plan for Remedial Action Activities
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	X		X
Sampling of Monitoring Wells		X	
Injection Point Work	X	X	

TABLE 4

REQUIRED LEVELS OF PROTECTION FOR RA TASKS

Health and Safety Plan for Remedial Action Activities
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.

APPENDIX A-1

EMERGENCY RESPONSE PLAN

HASP
APPENDIX A-1

EMERGENCY RESPONSE PLAN
for
REMEDIAL ACTION WORK PLAN
ACTIVITIES

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

October 2013
Rev. March 2014

0188-013-001

Prepared for:

Eyezon Associates, Inc.

Prepared By:

TurnKey Environmental Restoration, LLC

In Association With

Benchmark Environmental Engineering & Science, PLLC

APPENDIX A-1: EMERGENCY RESPONSE PLAN
HEALTH AND SAFETY PLAN FOR
REMEDIAL ACTION WORK PLAN ACTIVITIES

500 South Union Street Site
BCP Site No. C828153

Table of Contents

LIST OF FIGURES

1.0 GENERAL

This report presents the site-specific Emergency Response Plan (ERP) referenced in the Health and Safety Plan (HASP) prepared for Remedial Action (RA) activities at 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 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
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 must 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:

- Skin Contact: 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 Lakeside Memorial Hospital.

- Inhalation: Move to fresh air and, if necessary, transport to Lakeside Memorial Hospital.

- Ingestion: Decontaminate and transport to Lakeside 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:

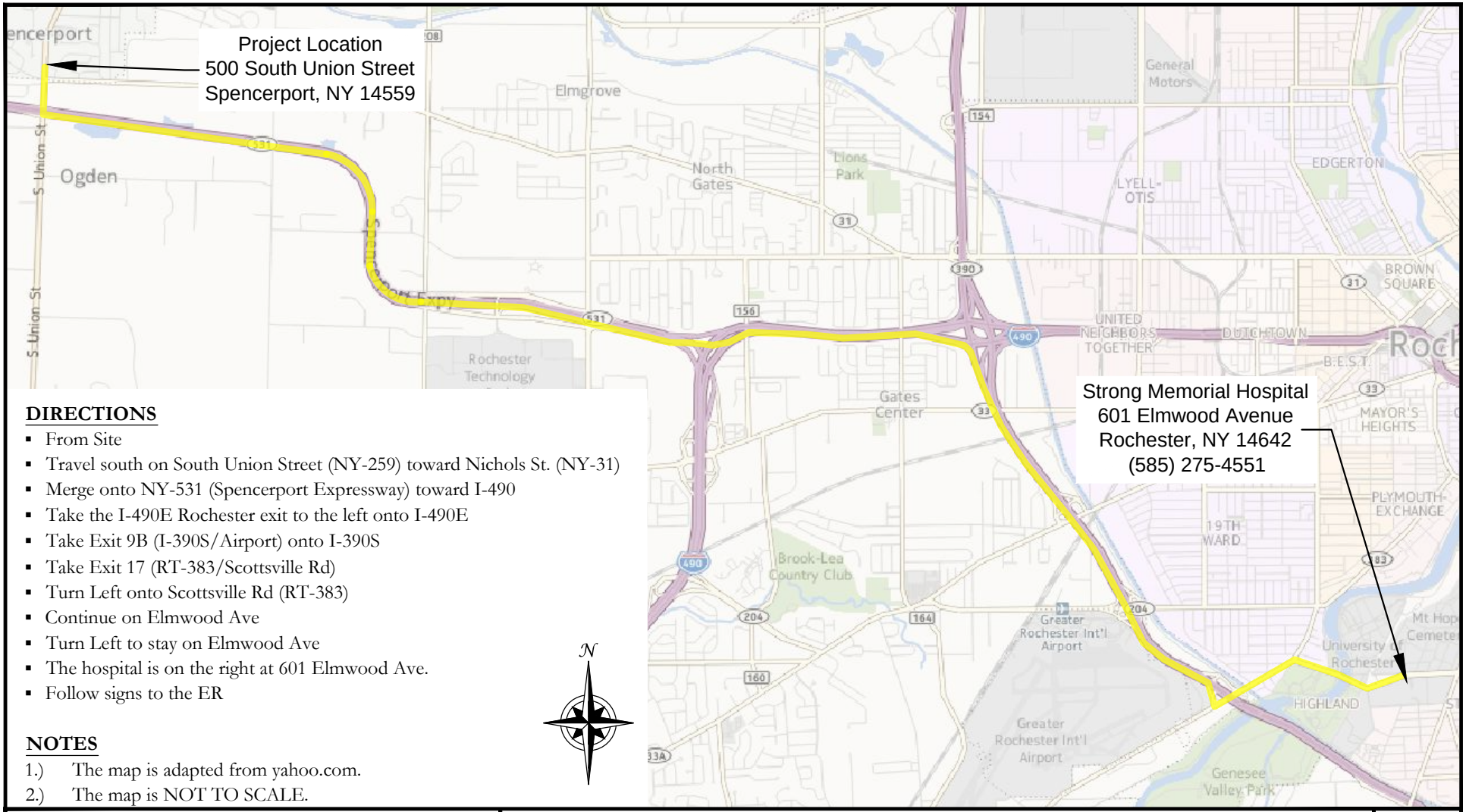
- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by the client.
- Records and reports required by local, state, federal and/or international agencies.
- Property or equipment damage.
- Third party injury 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 off-site organizations has been evaluated and is deemed adequate for response to this Site.

FIGURES

F:\CAD\TurnKey\Eyezon Associates\Remedial Action Work Plan\Figure A-1; Hospital Route Map (HASP).dwg



DIRECTIONS

- From Site
- 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
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- 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

NOTES

1.) The map is adapted from yahoo.com.
2.) The map is NOT TO SCALE.

TurnKey Environmental Restoration, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0188-013-001

DATE: OCTOBER 2013

DRAFTED BY: JCT

HOSPITAL ROUTE MAP

HEALTH AND SAFETY PLAN

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

PREPARED FOR

EYEZON ASSOCIATES, INC.

FIGURE A-1

DISCLAIMER:
PROPERTY OF TURNKEY ENV. REST., 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 ENV. REST., LLC.

APPENDIX A-2

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN (CAMP)

Appendix C1
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Appendix C2
Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX A-3

HOT WORK PERMIT

HOT WORK PERMIT

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 issued without being reviewed and approved by Thomas H. Forbes (Corporate Health and Safety Director). Required Signature below.

PART 3 - REQUIRED CONDITIONS**

(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 met.

SIGNATURES

Orginating Employee:	Date:
Project Manager:	Date:
Part 2 Approval:	Date:

Prepared By: _____

APPENDIX A-4

REGENESIS 3-D MICROEMULSION®

3-D MicroEmulsion™ HRC ADVANCED®

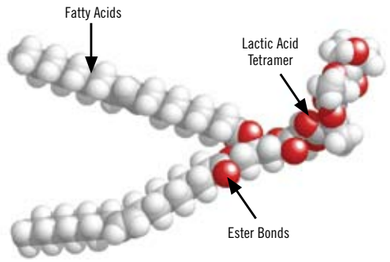
Achieve wide-area, rapid and sustai ned reductive dechlorination with continuous distribution and staged hydrogen release

3-D MicroEmulsion™ HRC ADVANCED®

PRODUCT FEATURES

- **Three Stage Electron Donor Release – Immediate, Mid-Range and Long-Term Hydrogen Production**
  - Provides free lactic acid, controlled-release lactic acid and long release fatty acids for effective hydrogen production for periods of up to 3 to 5 years.
- **Low-Cost**
  - 3-D Microemulsion is 25¢ to 42¢ 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.

FIGURE 1: THE 3-D MICROEMULSION MOLECULAR STRUCTURE



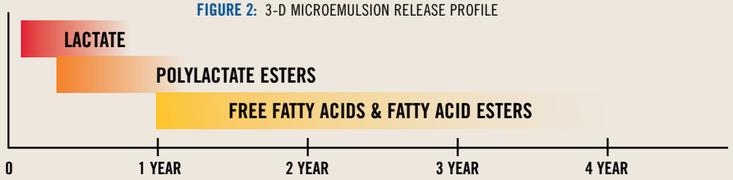
PRODUCT COMPOSITION

3-D Microemulsion (3DMe)™ is a form of HRC Advanced® and has a molecular structure specifically designed to maximize the cost-effective 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.

FIGURE 2: 3-D MICROEMULSION RELEASE PROFILE



APPLICATION AND DISTRIBUTION

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**.

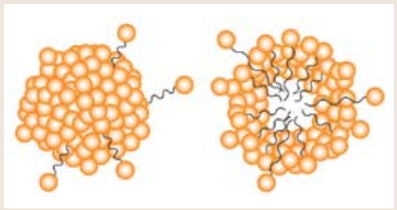
3DMe is typically applied in high-volumes as an emulsified, micellar suspension (microemulsion). The microemulsion is easily pumped into the subsurface and is produced on-site by mixing specified volumes of water and delivered 3DMe concentrate. Detailed preparation and installation instructions are available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



MORE ON APPLICATIONS

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

The microemulsion is easily prepared on-site and applied in high-volumes for maximum subsurface distribution.

3-D Microemulsion is typically applied through permanent wells or by using direct-push injection.

PERFORMANCE

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.

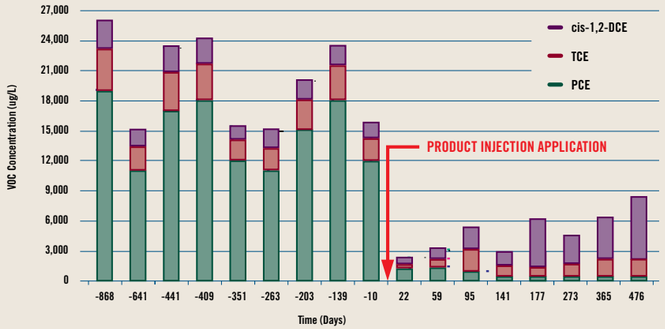


FIGURE 4: MW-16 CONTAMINANT CONCENTRATION DATA

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).

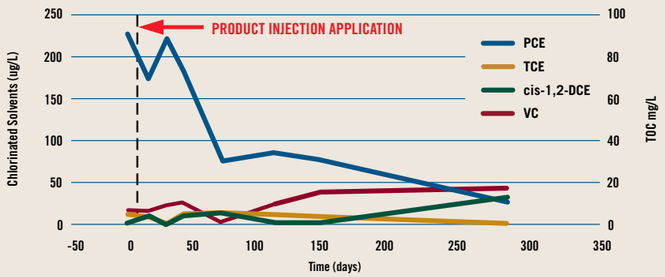


FIGURE 5: MW-103 CONTAMINANT CONCENTRATION DATA

PERFORMANCE

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 not temperature sensitive above 50ºF (10ºC). If the user plans to apply the product in cold weather, consideration should be given to warming the material to above 50ºF 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)

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.

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

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

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:

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).

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
    - range should be selected based on site specific requirements
- Pressure-Relief Valves for prevention of pressure buildup in various segments of the application tooling
    - 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:

1011 Calle Sombra
San Clemente, CA 92673

Phone: **949.366.8000**

Fax: **949.366.8090**

E-mail: **info@regenesis.com**

Chemical Name(s):	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**

Section 3 – Physical Data

Melting Point:	**Not Available (NA)**
Boiling Point:	**100 ºC**
Flash Point:	**> 93.3 ºC 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.**

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 exposure which elicits a reaction, a physician should be consulted immediately.

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:	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 B

MASTER EROSION CONTROL PLAN

APPENDIX B
REMEDIAL ACTION WORK PLAN

MASTER EROSION CONTROL PLAN

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

October 2013 0188-013-001

Prepared for:

Eyezon Associates, Inc.

Prepared By:

TurnKey Environmental Restoration, LLC

In Association With

Benchmark Environmental Engineering & Science, PLLC

TABLE OF CONTENTS

LIST OF ATTACHMENTS

1.0 INTRODUCTION

1.1 Background

Eyezon Associates, Inc. (Eyezon) has elected to pursue cleanup of the property, located at 500 South Union Street, Spencerport, New York, under the New York State Brownfield Cleanup Program (BCP or Program) and has been accepted into the Program (Site No. C828153) by the New York State Department of Environmental Conservation (NYSDEC).

The subject property (hereinafter, the "Project Site" or the "Site") is an approximate 1.2 acre parcel consisting of an approximate 12,750 square foot, multi-tenant commercial building, with the remainder of the Site primarily covered by asphalt and concrete, and landscaped areas.

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 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..

1.2 Purpose and Scope

This Master Erosion Control Plan (MECP) was prepared to provide guidance during Remedial Action (RA) activities since erosion control will be a critical component of preventing the potential migration of contaminants off-site during excavation activities. This document is generic in nature and provides minimum erosion control practices to be used.

2.0 GENERAL PERMIT REQUIREMENTS

If construction activities disturb more than 1 acre of land, the Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et. seq.) and the New York State Environmental Conservation Law (Article 17, Titles 7 and 8, and Article 70) would apply.

With some exceptions, operators of construction activities that will result in the disturbance of 1 or more acres of land must obtain coverage under SPDES General Permit (GP-02-01) prior to the commencement of soil disturbance. Also requiring a permit are construction activities disturbing less than 1 acre if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than 1 acre, or activities that are designated by the NYSDEC. The NYSDEC can require a permit for construction activities disturbing less than 1 acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

The remedial activities planned for the Site will not disturb more than one-acre, and as such, the General Permit requirements will not apply to the Site.

3.0 POTENTIAL EROSION AND SEDIMENT CONTROL CONCERNS

Potential areas and items of concern during RA activities may include the following:

- Remediated areas or off-site properties adjacent to unremediated parcels need protection so they do not become impacted by Site operations.
- Storm water inlets will require protective measures to limit sediment transfer to storm sewers.
- Runoff from soil stockpiles will require erosion controls.
- Surface slopes need to be minimized as much as practical to control sediment transfer.
- Soil/fill excavated will require proper handling and disposal.

4.0 EROSION AND SEDIMENT CONTROL MEASURES

4.1 Background

Standard soil conservation practices need to be incorporated into RA activities to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. These practices combine vegetative and structural measures, many of which will be permanent in nature and become part of the completed project (i.e., drainage channels and grading). Other measures will be temporary and serve only during the construction stage. Selected erosion and sediment control measures will meet the following criteria:

- Incorporate temporary and permanent erosion control measures.
- Remove sediment from sediment-laden storm water before it leaves the Site.

4.2 Temporary Measures

Temporary erosion and sedimentation control measures and facilities will be used during construction. These temporary measures will be installed and maintained until they are either no longer needed or until such time as permanent measures are installed and become effective. Erosion and sediment controls shall be installed in accordance with the standards and specifications presented in Attachment B-2. At a minimum, the following temporary measures will be used:

- Silt fencing
- Straw/hay bales
- Temporary vegetation/mulching
- Temporary sedimentation basins
- Cautious placement, compaction and grading of stockpiles

4.2.1 Silt Fencing

RA activities may result in surface water flow to drainage ditches and swales, storm sewers, and adjacent properties. Silt fencing will be the primary sediment control measure used in these areas. Prior to extensive soil excavation or grading activities, silt fences will be installed along the perimeter of all construction areas. The orientation of the fencing will be adjusted as necessary as the work proceeds to accommodate changing site conditions.

If necessary, intermediate fencing will be used upgradient of the perimeter fencing to help lower surface water runoff velocities and reduce the volume of sediment to perimeter fencing. Stockpiles will also be surrounded with silt fencing.

As sediment collects, the silt fences will be cleaned as necessary to maintain their integrity. Removed sediment will be used elsewhere on-site as general fill. All perimeter silt fences will remain in place until construction activities in an area are completed and vegetative cover has been established.

4.2.2 Straw and/or Hay Bales

Straw and/or hay bales will be used to intercept sediment laden storm water runoff in drainage channels during construction. The use of either hay or straw will be based on the availability of materials at the time of construction.

Bales will be placed in swales and ditches where the anticipated flow velocity is not expected to be greater than 5 feet/second (fps). Intermediate bales will be placed upgradient of the final barrier to reduce flow velocities and sediment loadings where higher velocities are anticipated.

As with silt fencing, sediment will be removed as necessary from behind the bales and disposed of on-site. Bales that have become laden with sediment or that have lost their structural integrity or effectiveness due to the weather will be replaced.

4.2.3 Temporary Sedimentation Basins

Temporary sedimentation basins will be constructed as necessary upgradient of storm water inlets to reduce the volume of sediment laden runoff from the Site. The basins can be as simple as a small excavated area along the alignment of a storm water ditch or as elaborate as a full-scale sedimentation basin with outlet structures designed for certain storm events from a given area of the Site. The basins will be cleaned as necessary and the removed sediment used elsewhere on-site as subgrade fill material.

4.2.4 Cautious Placement of Stockpiles

Excavation activities may produce stockpiles of soil and subgrade soil/fill materials. Careful placement and construction of stockpiles will be required to control erosion. Stockpiles will be placed no closer than 50 feet from storm water inlets and parcel

boundaries. Additionally, stockpiles will be graded and compacted as necessary for positive surface water runoff and dust control.

4.3 Permanent Control Measures during Site Redevelopment

Permanent erosion and sedimentation control measures and structures will be installed as soon as practical during construction for long-term erosion protection. Examples of permanent erosion control measures could include:

- Minimizing the potential contact with, and migration of, subsurface soil/fill through the placement of a "clean" soil cover system in all areas not covered with structures, roads, parking areas, sidewalks, etc.
- Planting and maintaining vegetation.
- Limiting runoff flow velocities to the extent practical.

5.0 CONSTRUCTION MANAGEMENT PRACTICES

5.1 General

The following general construction practices should be evaluated for erosion and sedimentation control purposes during RA activities:

- Clearing and grading only as much area as is necessary to accommodate the construction needs to minimize disturbance of areas subject to erosion (i.e., phasing the work).
- Covering exposed or disturbed areas of the Site as quickly as practical.
- Installing erosion and sediment control measures before disturbing the Site subgrade.
- Minimizing both on-site and off-site tracking of soil by vehicles by using routine entry/exit routes.

5.2 Monitoring, Inspection and Maintenance

All erosion and sedimentation controls described in this Plan will be inspected by a qualified representative of the Site Owner within 24 hours of a heavy rainfall event (defined as more than 0.5 inches of precipitation in a 24-hour period) and repaired or modified as necessary to effectively control erosion or turbidity problems. Inspections should include areas under construction, stockpile areas, erosion control devices (i.e., silt fences, hay bales, etc.) and locations where vehicles enter and leave the site. Routine inspections of the entire Site should also be made on a weekly basis during development.

If inspections indicate problems, corrective measures should be implemented within 24 hours. A report summarizing the scope of the inspection, name of the inspector, date, observations made, and a description of the corrective actions taken should be completed. Attachment B-3 includes the Inspection and Maintenance Report Form.

5.2.1 Implementation

Erosion controls and features shall, at all times, be properly constructed, operated, and maintained in accordance with regulatory requirements and good engineering and construction practices. Erosion control measures and activities will be conducted in accordance with currently accepted Best Management Practices (BMPs).

Erosion control monitoring, inspection, and maintenance are an integral part of Site storm water and erosion control. The key elements of the monitoring effort include the following:

- Site inspections and maintenance
- BMPs monitoring
- Recordkeeping
- Review and modifications
- Certification of compliance

5.2.2 Site Inspections and Maintenance Practices

The temporary erosion control features will be maintained until no longer needed or permanent erosion control methods are installed. Site inspections are required every seven days or within 24 hours of a rainfall of 0.5 inches or greater. All disturbed areas, areas for material storage, locations where vehicles enter or exit the site, and all of the erosion and sediment controls identified as part of this Plan must be inspected. Controls must be in good operating condition until the affected area they protect has been completely stabilized and the construction activity is complete. If a repair is necessary, it must be completed within seven days of receipt of a report or notice, if practical. Inspection for specific erosion and sediment controls will include the following:

- Silt fence will be inspected to determine the following:
  1) Depth
  2) Condition of fabric
  3) That the fabric is attached to the posts
  4) That the fence posts are firmly in the ground
- The silt fences will be inspected weekly and within 24 hours of a 0.5 inch or greater storm event.
- Diversion berms, if used, will be inspected and any breaches promptly repaired.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and other potential erosion control problems.
- The Contractor shall designate individual(s) that will be responsible for erosion control, maintenance, and repair activities. The designated individual will also be responsible for inspecting the site and filling out the inspection and maintenance report.

- Personnel selected for inspection and maintenance responsibilities will receive training as directed by the Engineer. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used on-site in good working order.

The individual inspecting the Site must record any damages or deficiencies on the Inspection and Maintenance Report Form in Attachment B-3. This form can be used to request maintenance and repair and to document inspection and maintenance activities. Damages or deficiencies must be corrected as soon as possible after the inspection. Any changes that may be required to correct deficiencies in this Plan should also be made as soon as possible, but in no case later than seven days after the inspection.

5.2.3 Recordkeeping

A copy of the MECP and inspection and maintenance records must be kept at the Site from the time construction activities begins until the Site is stabilized. These documents will be made available upon request to regulatory agency representatives or members of the public.

5.2.4 Modifications to the Storm Water Management and Erosion Control Plan

During the course of construction, unanticipated changes may occur that affect this MECP such as schedule changes, phasing changes, staging area modifications, off-site drainage impacts, and repeated failures of designed controls. Any changes to the activities and controls identified in this Plan must be documented and the Plan revised accordingly. Certification of revisions to this plan shall be included at the end of the document.

ATTACHMENT B-1

EROSION CONTROL DETAILS

- Temporary Critical Area Plantings
- Mulching
- Straw Bale Dike
- Silt Fence
- Sediment Trap

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

New York State Standards and Specifications for Erosion and Sediment Control

August 2005

New York State
Department of Environmental Conservation

George E. Pataki, Governor

STANDARD AND SPECIFICATIONS FOR TEMPORARY CRITICAL AREA PLANTINGS

Definition

Providing erosion control protection to a critical area for an interim period. A critical area is any disturbed, denuded slope subject to erosion.

Purpose

To provide temporary erosion and sediment control. Temporary control is achieved by covering all bare ground areas that exist as a result of construction or a natural event.

Conditions Where Practice Applies

Temporary seedings may be necessary on construction sites to protect an area, or section, where final grading is complete, when preparing for winter work shutdown, or to provide cover when permanent seedings are likely to fail due to mid-summer heat and drought. The intent is to provide temporary protective cover during temporary shutdown of construction and/or while waiting for optimal planting time.

Criteria

Water management practices must be installed as appropriate for site conditions. The area must be rough graded and slopes physically stable. Large debris and rocks are usually removed. Seedbed must be seeded within 24 hours of disturbance or scarification of the soil surface will be necessary prior to seeding.

Fertilizer or lime are not typically used for temporary seedings.

IF: Spring or summer or early fall, then seed the area with ryegrass (annual or perennial) at 30 lbs. per acre (Approximately 0.7 lb./1000 sq. ft. or use 1 lb./1000 sq. ft.).
IF: Late fall or early winter, then seed Certified 'Aroostook' winter rye (cereal rye) at 100 lbs. per acre (2.5 lbs./1000 sq. ft.).

Any seeding method may be used that will provide uniform application of seed to the area and result in relatively good soil to seed contact.

Mulch the area with hay or straw at 2 tons/acre (approx. 90 lbs./1000 sq. ft. or 2 bales). Quality of hay or straw mulch allowable will be determined based on long term use and visual concerns. Mulch anchoring will be required where wind or areas of concentrated water are of concern. Wood fiber hydromulch or other sprayable products approved for erosion control (nylon web or mesh) may be used if applied according to manufacturers' specification. Caution is advised when using nylon or other synthetic products. They may be difficult to remove prior to final seeding.

STANDARD AND SPECIFICATIONS FOR MULCHING

Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/ acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7”	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2”	9 cu. yds.	405 cu. yds.	3”	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/yd. 60-90 lbs./roll	48” x 50 yds. or 48” x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8” x 100” 2-sided plastic, 48” x 180” 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3” pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3”	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

Table 3.8
Mulch Anchoring Guide

Anchoring Method or Material	Kind of Mulch to be Anchored	How to Apply
1. Peg and Twine	Hay or straw	After mulching, divide areas into blocks approximately 1 sq. yd. in size. Drive 4-6 pegs per block to within 2" to 3" of soil surface. Secure mulch to surface by stretching twine between pegs in criss-cross pattern on each block. Secure twine around each peg with 2 or more tight turns. Drive pegs flush with soil. Driving stakes into ground tightens the twine.
2. Mulch netting	Hay or straw	Staple the light-weight paper, jute, wood fiber, or plastic nettings to soil surface according to manufacturer's recommendations. Should be biodegradable. Most products are not suitable for foot traffic.
3. Wood cellulose fiber	Hay or straw	Apply with hydroseeder immediately after mulching. Use 500 lbs. wood fiber per acre. Some products contain an adhesive material ("tackifier"), possibly advantageous.
4. Mulch anchoring tool	Hay or straw	Apply mulch and pull a mulch anchoring tool (blunt, straight discs) over mulch as near to the contour as possible. Mulch material should be "tucked" into soil surface about 3".
5. Tackifier	Hay or straw	Mix and apply polymeric and gum tackifiers according to manufacturer's instructions. Avoid application during rain. A 24-hour curing period and a soil temperature higher than 45^0 Fahrenheit are required.

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw, or similar material, used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes have an estimated design life of three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits.

Constructed Slope	Percent Slope	Slope Length (ft.)
2:1	50	25
3:1	33	50
4:1	25	75

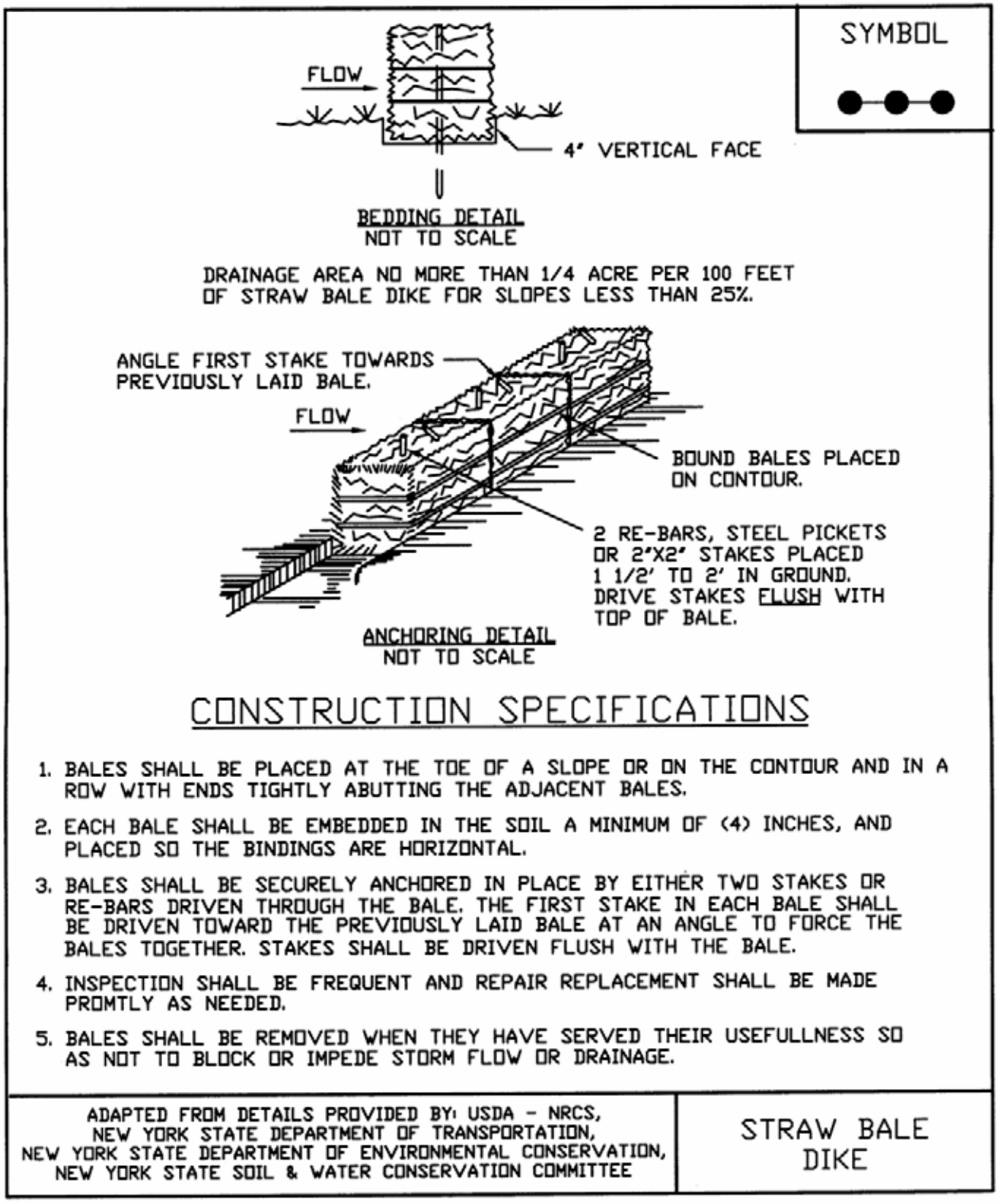
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage areas in this instance shall be less than one quarter of an acre per 100 feet of fence and the length of slope above the dike shall be less than 200 feet.

Design Criteria

The above table is adequate, in general, for a one-inch rainfall event. Larger storms could cause failure of this practice. Use of this practice in sensitive areas for longer than one month should be specifically designed to store expected runoff. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 5A.7 on page 5A.18 or details.

Figure 5A.7
Straw Bale Dike



STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

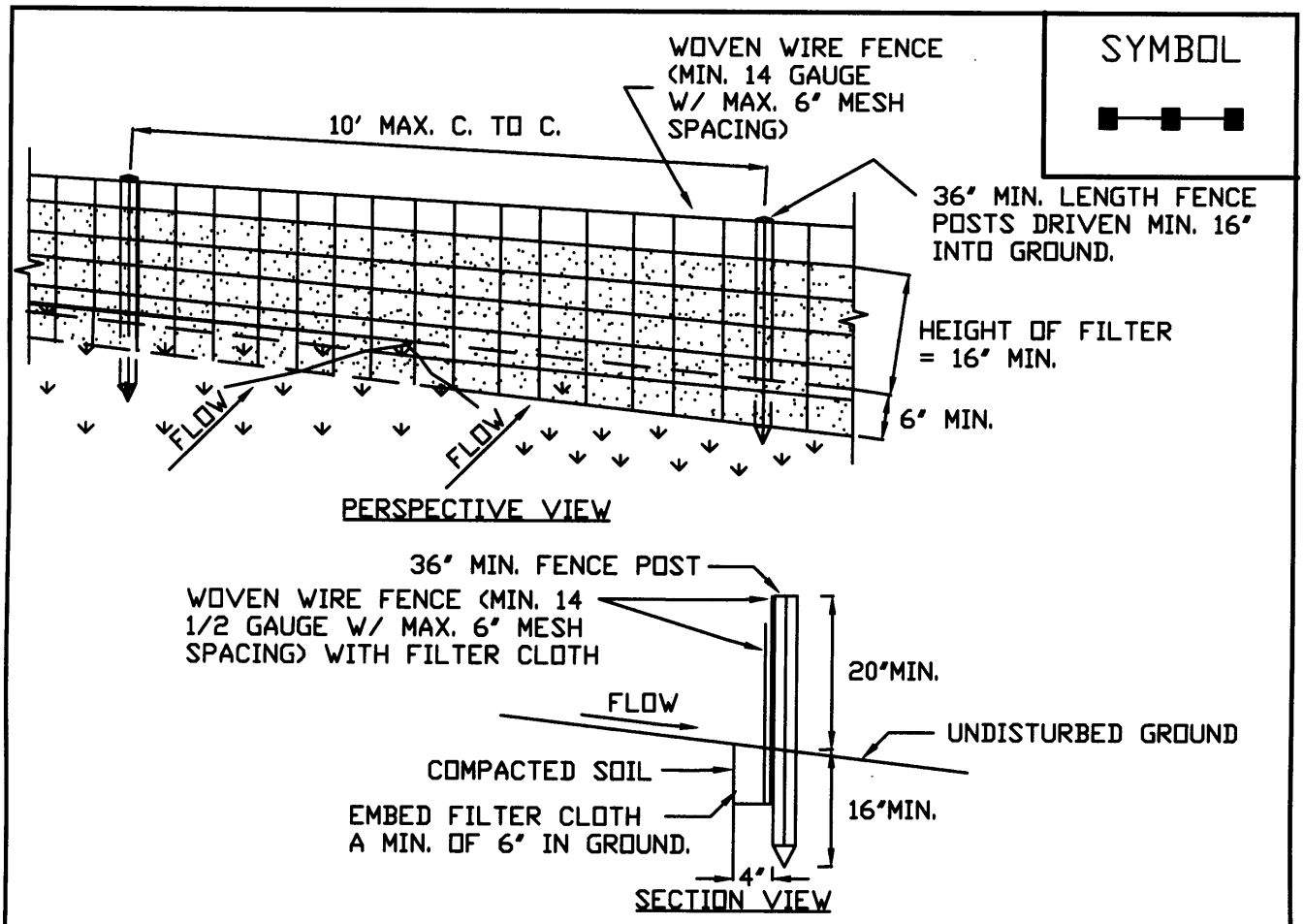
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in Figure 5A.8.

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

ATTACHMENT B-2

INSPECTION AND MAINTENANCE REPORT FORM

Inspection and Maintenance Report Form

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Regular Inspector:_____Rainfall Event Inspector:_____Rainfall (inches):_____

Contractor Activities	OK	NO	N/A	Notes
Are construction onsite traffic routes, parking, and storage of equipment and supplies restricted to areas specifically designated for those uses?				
Are locations of temporary soil stock piles of construction materials in approved areas?				
Is there any evidence of spills and resulting cleanup procedures?				
General Erosion & Sediment Controls				
Are sediment and erosion BMPs installed in the proper location and according to the specifications set out in the SWM & ECP?				
Are all operational storm drain inlets protected from sediment inflow?				
Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?				
Is there any evidence that sediment is leaving the site?				
Is there any evidence of erosion or cut fill slopes?				
Perimeter Road Use				
Does much sediment get tracked on to the perimeter road?				
Is the gravel clean or is it filled with sediment?				
Does all traffic use the perimeter road to leave the site?				
Is maintenance or repair required for the perimeter road?				

_____ _____

Inspected by (Signature) Date

Inspection and Maintenance Report Form

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Inspector:_____

STABILIZATION MEASURES					
Area	Date Since Last Disturbed	Date of Next Disturbance	Stabilized? Yes/No	Stabilized with	Condition

Stabilization Required: _____

_____

_____

_____

_____

_____

To be performed by: _____ On or before: _____

APPENDIX C

PROJECT DOCUMENTATION FORMS

INSPECTOR'S DAILY REPORT

Page | of

CONTRACTOR:	JOB NO.:
CLIENT:	DATE:

LOCATION:		DAY: Su M Tu W Th F Sa	
WEATHER:	TEMP: °F	START:	END:

WORK PERFORMED:

TEST PERFORMED:	QA PERSONNEL:
	SIGNATURE:

INSPECTOR'S DAILY REPORT

(CONTINUED) Page ____ of ____

CONTRACTOR:	JOB NO.:
CLIENT:	DATE:

MEETINGS HELD & RESULTS:

CONTRACTOR'S WORK FORCE AND EQUIPMENT

DESCRIPTION	H	#	DESCRIPTION	H	#	DESCRIPTION	H	#
Field Engineer						Front Loader Ton		
Superintendent						Bulldozer		
Laborer-Foreman						DJ Dump Truck		
Laborer						Water Truck		
Operating Engineer			Equipment			Backhoe		
Carpenter			Generators			Excavator		
Ironworker			Welding Equipment			Pad foot roller		
Concrete Finisher			Roller					
			Paving Equipment					
			Air Compressor					

REMARKS:

REFERENCES TO OTHER FORMS:

SAMPLES COLLECTED:

Sample Number:
Approx. Location of Stockpile:
No. of Stockpile
Date of Collection:
Weather:
Field Observations:

DAILY LOG	DATE			
	REPORT NO.			
	PAGE		OF	

PROBLEM IDENTIFICATION REPORT

Date:

Project:

Job No:

Location:

CQA Monitor(s):

Client:

Contractor:

Contractor's Supervisor:

WEATHER CONDITIONS:

Ambient Air Temp. - A.M.:

Ambient Air Temp. - P.M.:

Wind Direction:

Wind Speed:

Precipitation:

Problem Description:

Problem Location (reference test location, sketch on back of form as appropriate)

Problem Causes:

Suggested Corrective Measures or Variances:

Linked to Corrective Measures Report No. *or Variance Log No.*

Approvals (initial):

CQA Engineer:

Project Manager:

Signed:

CQA Representative

DAILY LOG	DATE			
	REPORT NO.			
	PAGE		OF	

CORRECTIVE MEASURES REPORT

Date:

Project:

Job No:

Location:

CQA Monitor(s):

Client:

Contractor:

Contractor's Supervisor:

WEATHER CONDITIONS:

Ambient Air Temp. - A.M.:

Ambient Air Temp. - P.M.:

Wind Direction:

Wind Speed:

Precipitation:

Corrective Measures Undertaken (reference Problem Identification Report No.)

Retesing Location:

Suggested Method of Minimizing Re-Occurrence:

Approvals (initial):

CQA Engineer:

Project Manager:

Signed:

CQA Representative

APPENDIX D

SOIL AND GROUNDWATER ANALYTICAL SUMMARY TABLES

TABLE 3

SUMMARY OF SUBSURFACE SOIL ANALYTICAL DATA (1998, 2008 & 2010)

Remedial Investigation/Alternatives Analysis Report
500 South Union Street Site
Spencerport, New York

Parameter[1]	Unrestricted Use SCOs[2]	Groundwater Protection SCOs[2]	Commercial SCOs[2]	Haley & Aldrich Historical Sample (Depth)				TurnKey Historical Sample (Depth)						Remedial Investigation Sample (Depth)						
				B101-S4 (8-10)	B104-S4 (6-8)	B105-S1 (0-2)	B107-S4 (6-8)	SB-1/PZ-1 (13.5-15)	SB-3/PZ-3 (12-13.5)	SB-5/PZ-5 (16.5-18)	SB-6/PZ-6 (15-16.5)	SB-8 (10-12)	SB-9 (18-20)	MW-1D (6-8)	MW-2D (12-14)	MW-3 (12-14)	MW-4D (22-24)	MW-5D (6-8)	PZ-8 (6-8)	Blind Dup #2[3]
				11/12/98	11/12/98	11/13/98	11/13/98	03/20/08	03/20/08	03/20/08	03/20/08	03/20/08	03/20/08	08/28/10	09/01/10	09/01/10	08/31/10	08/31/10	09/07/10	09/01/10
Volatile Organic Compounds (VOCs) - mg/kg																				
Acetone	**0.05**	**0.05**	**500**	ND	0.553	ND	ND	ND	ND	ND	ND	ND	0.006 J	ND	ND	ND	ND	ND	ND	ND
Benzene	**0.06**	**0.06**	**44**	ND	ND	ND	0.0055	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**0.25**	**0.25**	**500**	--	--	--	--	0.002 J	ND	0.008	0.002 J	ND	0.01	ND	ND	0.046	ND	ND	0.015 J	0.063
Ethylbenzene	**1**	**1**	**390**	ND	ND	1.4429	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	**2.3**	**2.3**	**500**	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.046	ND
Methylcyclohexane	**--**	**--**	**--**	--	--	--	--	ND	0.008	ND	ND	0.008	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	**0.05**	**0.05**	**500**	ND	ND	ND	ND	0.006	ND	0.007	0.007	ND	0.007	0.0034 J	0.0028 J	ND	0.0028 J	0.0035 J	0.033	ND
Tetrachloroethene	**1.3**	**1.3**	**150**	14.67	ND	ND	0.584	0.059	0.006	0.31 D	0.003 J	0.13	2.9 D	ND	0.022	ND	0.12	0.02	0.035	ND
Trichloroethene	**0.47**	**0.47**	**200**	ND	ND	ND	ND	0.01	ND	0.016	ND	ND	0.051	ND	ND	0.0025 J	ND	ND	ND	0.0046 J
m&p-Xylene	**0.26**	**1.6**	**500**	1.94	ND	0.2144	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
o-Xylenes	**0.26**	**1.6**	**500**	0.92	ND	0.504	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--
Tentatively Identified Compounds	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	0.014 B	0.0074	0.007	ND	0.0085 B	6.29	ND
Semi-Volatile Organic Compounds (SVOCs) (mg/kg)																				
Acenaphthene	**20**	**98**	**500**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.065 J	ND
Biphenyl	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.099 J	ND
Fluoranthene	**100**	**1000**	**500**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.032 J	ND
Phenanthrene	**100**	**1000**	**500**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.3	ND
Pyrene	**100**	**1000**	**500**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.024 J	ND
Tentatively Identified Compounds	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	23.12	ND
Total Metals (mg/kg)																				
Aluminum - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	8010	5500	6790	4370	4610	6520	6490
Arsenic - Total	**13**	**16**	**16**	--	--	--	--	--	--	--	--	--	--	3.4 J	ND	2.4	ND	ND	ND	ND
Barium - Total	**350**	**820**	**400**	--	--	--	--	--	--	--	--	--	--	46.1	32.7	68.5	26	36.1	47.2	57.1
Beryllium - Total	**7.2**	**47**	**590**	--	--	--	--	--	--	--	--	--	--	0.427	0.267	0.41	ND	0.218	0.301	0.352
Calcium - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	34800	33100	37900	28500	35600	31300	34200
Chromium - Total	**30**	**--**	**1500**	--	--	--	--	--	--	--	--	--	--	10.5	7.63	9.84	6.3	6.65	9.3	9.32
Cobalt - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	6.94	6.04	7.41	4.25	4.36	6.22	6.44
Copper - Total	**50**	**1720**	**270**	--	--	--	--	--	--	--	--	--	--	8.7	4.4	7.3	4.7	4.4	7.1	6.7
Iron - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	14700	10500 B	12300 B	8480	8650	11800 B	11700
Lead - Total	**63**	**450**	**1000**	--	--	--	--	--	--	--	--	--	--	3.3	2	3	1.7	2	2.6	2.5
Magnesium - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	6130	7040	8340	7610	7340	6970	8000
Manganese - Total	**1600**	**2000**	**10000**	--	--	--	--	--	--	--	--	--	--	412 B	402 B	395 B	347 B	311 B	397 B	381
Nickel - Total	**30**	**130**	**310**	--	--	--	--	--	--	--	--	--	--	15.6	13	14.8	8.9	9.58	13.4	14.2
Potassium - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	1000	845	1210	750	786	1030	1180
Sodium - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	380	299	ND	ND	ND	ND	ND
Vanadium - Total	**--**	**--**	**--**	--	--	--	--	--	--	--	--	--	--	16.3	10.6	13	9.37	9.32	13.2	12.5
Zinc - Total	**109**	**2480**	**10000**	--	--	--	--	--	--	--	--	--	--	33.9	27.1	31.1	20	20.4	29	29.6
Pesticides and Herbicides (mg/Kg)																				
alpha-BHC	**0.02**	**0.02**	**3.4**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.0012 J	ND
Endosulfan I	**2.4**	**102**	**200**	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	ND	ND	0.00067 J	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)
3. Blind Dup #2 is associated with MW-3.

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.
B = Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
D = Compounds were identified in an analysis at the secondary dilution factor.

= Result exceeds 6NYCRR Part 375 Unrestricted SCO.
= Result exceeds Protection of Groundwater Standard and Unrestricted SCO.
= Result exceeds 6NYCRR Part 375 Commercial SCO.

TABLE 4A

SUMMARY OF RI AND HISTORIC GROUNDWATER ANALYTICAL DATA - VOCs

Remedial Investigation/ Alternatives Analysis Report
500 South Union Street Site
Spencerport, New York

Monitoring Location & Sample Date		Parameter[1]																							
		TCL + STARS Volatile Organic Compounds (ug/L)																				Field Measurements (units as indicated)					
		1,1-Dichloroethene	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Acetone	Carbon disulfide	Chloroform	Chloromethane (Methyl chloride)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Dichlorodifluoromethane (Freon-12)	Methyl tert butyl ether (MTBE)	Tetrachloroethene	Toluene	Trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	*Tentitively Identified Compunds*	*Total cVOCs*	*Total VOCs*	pH (units)	Temperature (°C)	Sp. Cond. (uS)	Turbidity	DO (ppm)	ORP (mV)
GWQS[2]		**5**	**50**	**--**	**50**	**--**	**7**	**5**	**5**	**5**	**5**	**--**	**5**	**5**	**5**	**5**	**2**	**--**	--	--	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
Shallow Overburden Wells / Piezometers																										
PZ-1	3/8/08	ND	ND	3 J	9	ND	ND	ND	**8**	ND	ND	ND	**52**	ND	ND	**20**	ND	ND	80	92	--	--	--	--	--	--
	9/27/10	0.69 J	ND	ND	3.2 BJ	ND	ND	ND	**44**	ND	ND	ND	**190**	ND	ND	**99**	ND	ND	334	337	7.51	17.5	804	>1000	3.61	76
	5/11/11	ND	ND	ND	ND	ND	ND	ND	**22**	ND	ND	ND	**130 D**	ND	ND	**80**	ND	ND	232	232	7.28	16.8	762.8	>1000	3.65	70
PZ-2	3/8/08	ND	ND	ND	ND	1	1	ND	ND	ND	ND	ND	**340 D**	ND	ND	2	ND	ND	343	344	--	--	--	--	--	--
	9/27/10	ND	ND	ND	4.4 J	ND	ND	ND	**8.1**	ND	ND	ND	**11**	ND	ND	3.4	ND	ND	23	27	NM	NM	NM	NM	NM	NM
	5/10/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	8.22	13.5	2650	238	5.98	61
PZ-3	3/8/08	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	6	--	--	--	--	--	--
	511/11	ND	ND	ND	**53**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12**	ND	12	65	7.49	19.1	1705	4.36	6.17	- 29
PZ-4	3/8/08	ND	ND	ND	6	1	ND	0.6 J	ND	ND	ND	ND	**30**	ND	ND	2	ND	ND	33	40	--	--	--	--	--	--
	9/28/10	ND	ND	ND	ND	ND	0.78 J	ND	ND	ND	ND	ND	**130**	ND	ND	ND	ND	ND	130	130	7.41	22.4	1562	884	5.77	65
	5/11/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**100**	ND	ND	ND	ND	ND	100	100	7.35	15.9	1140	348	4.1	44
PZ-5	3/8/08	ND	ND	ND	ND	ND	ND	ND	**9**	ND	ND	ND	**1600 D**	ND	ND	**33**	ND	ND	1642	1642	--	--	--	--	--	--
	9/28/10	ND	ND	ND	ND	ND	ND	ND	**26 D**	ND	ND	ND	**3100 D**	ND	ND	**85 D**	ND	ND	3211	3211	7.40	21.7	19.8	617	5.94	24
	5/11/11	ND	ND	ND	ND	ND	0.59 J	ND	**28**	ND	ND	ND	**4000 D**	ND	ND	**140**	ND	5 J	4168	4173	7.26	16.7	1423	803	3.46	10
PZ-6	3/8/08	2	3 J	8	11	1	ND	ND	**510 D**	ND	ND	2	**53**	0.7 J	2	**110 D**	**9**	ND	686	712	--	--	--	--	--	--
	9/28/10	2.8 D,J	ND	ND	ND	ND	ND	ND	**660 D**	ND	ND	ND	**30 D**	ND	ND	**180 D**	**8.1 D**	ND	881	881	7.06	21.6	624	>1000	0.2	54
	5/11/11	ND	ND	ND	ND	ND	ND	ND	**290**	ND	ND	ND	**26**	ND	ND	**51**	ND	ND	367	367	7.13	17.3	768.5	312	3.6	36
PZ-7	6/8/08	ND	ND	ND	5	ND	ND	ND	**20**	ND	ND	0.31 J	0.68 J	ND	ND	2	0.92 J	ND	24	29	--	--	--	--	--	--
PZ-8	9/27/10	ND	ND	ND	ND	ND	ND	0.68 J	**220**	ND	ND	ND	3.4	ND	1	**6.5**	ND	ND	232	232	7.11	16.9	457	>1000	4.47	102
	5/11/11	ND	ND	ND	ND	ND	ND	ND	**130**	ND	ND	ND	ND	ND	ND	ND	ND	ND	130	130	7.02	16.7	316.7	1000	3.51	82
MW-3	9/28/10	ND	ND	ND	ND	ND	ND	ND	**2000 D**	ND	ND	ND	**40 D,J**	ND	ND	**62 D**	ND	ND	2102	2102	6.56	19.4	2001	25.8	2.94	71
	5/11/11	ND	ND	ND	ND	ND	ND	ND	**1700**	ND	ND	ND	ND	ND	ND	**32**	**38**	ND	1770	1770	6.80	12	2909	19.9	2.38	119
MW-103	11/8/98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.4**	ND	3.8	**2.5**	ND	ND	19	19	--	--	--	--	--	--
	9/28/10	ND	ND	ND	ND	ND	ND	ND	1.9	ND	ND	ND	2.4	ND	ND	2.4	ND	ND	7	7	7.14	22	4232	58	3.41	0
	5/11/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	6.69	15.2	5691	19.6	2.15	137
MW-106	11/8/98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1072**	ND	ND	ND	ND	ND	1072	1072	--	--	--	--	--	--
	6/8/08	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.84	0.67 J	**230 D**	ND	ND	ND	ND	ND	230	232	--	--	--	--	--	--
	9/27/10	ND	ND	ND	ND	ND	ND	ND	0.84 J	ND	3.2 J	ND	**270 D**	ND	ND	ND	ND	ND	271	274	7.44	17.2	1552	51	3.78	54
	5/11/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**160**	ND	ND	ND	ND	ND	160	160	6.95	14.1	25.4	60.4	3.38	77
MW-107	11/8/98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**172.4**	ND	ND	**29.6**	ND	ND	202	202	--	--	--	--	--	--
Blind 1[3]	5/10/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	6.69	15.2	5691	19.6	2.15	137

TABLE 4A

SUMMARY OF RI AND HISTORIC GROUNDWATER ANALYTICAL DATA - VOCs

Remedial Investigation/ Alternatives Analysis Report
500 South Union Street Site
Spencerport, New York

Monitoring Location & Sample Date		Parameter[1]																							
		TCL + STARS Volatile Organic Compounds (ug/L)																		Field Measurements (units as indicated)					
		1,1-Dichloroethene	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Acetone	Carbon disulfide	Chloroform	Chloromethane (Methyl chloride)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Dichlorodifluoromethane (Freon-12)	Methyl tert butyl ether (MTBE)	Tetrachloroethene	Toluene	Trans-1,2-Dichloroethene	Trichloroethene	Vinyl chloride	*Tentitively Identified Compunds*	*Total cVOCs*	*Total VOCs*	pH (units)	Temperature (°C)	Sp. Cond. (uS)	Turbidity	DO (ppm)	ORP (mV)
GWQS[2]		**5**	**50**	**--**	**50**	**--**	**7**	**5**	**5**	**5**	**5**	**--**	**5**	**5**	**5**	**5**	**2**	**--**	--	--	**6.5 - 8.5**	**--**	**--**	**--**	**--**	**--**
Deep Overburden Wells																										
MW-1D	9/28/10	ND	ND	ND	ND	ND	0.81 J	ND	**6.7**	ND	ND	ND	**12**	ND	3.5	2	ND	ND	25	25	7.03	19.7	2380	38	3.33	48
	5/11/11	ND	ND	ND	ND	ND	ND	ND	**6**	ND	ND	ND	**18**	ND	ND	ND	ND	ND	24	24	6.85	18.4	3553	24.4	2.77	110
MW-2D	9/28/10	ND	ND	ND	ND	ND	ND	ND	**11**	ND	ND	ND	**1400 D**	ND	ND	**33**	1.4	ND	1445	1445	7.05	21	3690	67	2.26	100
	5/10/11	ND	ND	ND	ND	ND	ND	ND	**15**	ND	ND	ND	**2000 D**	ND	ND	**53**	ND	ND	2068	2068	6.98	12.2	3604	123	2.14	117
MW-4D	9/27/10	ND	ND	ND	ND	ND	ND	ND	1.7	ND	1 J	ND	**1800 D**	ND	ND	**5.9**	ND	ND	1808	1809	7.40	15.2	1137	151	1.63	84
	5/10/11	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	**1900 D**	ND	ND	ND	ND	ND	1901	1901	7.23	13.3	1366	8.75	2.88	66
MW-5D	9/27/10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.79 J	**120 D**	ND	ND	ND	ND	ND	120	121	7.54	14.7	1268	38.1	5.78	-25
	5/11/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**140 D**	ND	ND	ND	ND	5.9 J	140	146	7.04	19.1	1306	7.14	1.84	62
Blind 1[4]	9/27/10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2200 D**	ND	ND	ND	ND	ND	2200	2200	7.40	15.2	1137	151	1.63	84
Blind 2[5]	5/10/11	ND	ND	ND	ND	ND	ND	ND	**5.5**	ND	ND	ND	**18**	ND	ND	3.8 J	ND	ND	27	27	6.85	18.4	3553	24.4	2.77	110
Blind 3[6]	5/11/11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0	7.04	19.1	1306	7.14	1.84	62

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. Blind 1 is associated with MW-103 (5/11/11).
4. Blind 1 is associated with MW-4D (9/27/10).
5. Blind 2 is associated with MW-1D (5/11/11).
6. Blind 3 is associated with MW-5D (5/11/11).

Definitions:

ND = Parameter not detected above laboratory detection limit.
NM = Not measured; insufficient volume to analyze field parameters
"--" = No value available for the parameter.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detected in assoziated method blank.
C= Calibration Varification recovery was above the method control limit for the analyte. A high bias may be indicated.
D = Compounds were identified in an analyisis at the secondary dilution factor.
Bold = Result exceeds GWQS.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 4B

SUMMARY OF RI GROUNDWATER ANALYTICAL DATA - SVOCs, Metals, PCBs, Pesticides, Herbicides

Remedial Investigation/Alternatives Analysis Report
500 South Union Street Site
Spencerport, New York

PARAMETER[1]	GWQS[2]	MW-1D		MW-2D		MW-3		MW-4D		MW-5D		MW-103		MW-106		Blind 1 [3]	Blind 1 [4]	Blind 2 [5]	Blind 3 [6]
		09/28/10	05/10/11	09/28/10	05/10/11	09/28/10	05/10/11	09/27/10	05/10/11	09/27/10	05/11/11	09/28/10	05/11/11	09/27/10	05/11/11	09/27/10	05/10/11	05/10/11	05/11/11
Semi-Volatile Organic Compounds (SVOCs) (ug/L)																			
Benzo(a)anthracene	**0.002**	ND	--	ND	--	ND	--	ND	ND	ND	--	**0.56 J**	ND	ND	--	ND	ND	--	--
Benzo(a)pyrene	**--**	ND	--	ND	--	ND	--	ND	ND	ND	--	0.83 J	ND	ND	--	ND	ND	--	--
Benzo(b)fluoranthene	**0.002**	ND	--	ND	--	ND	--	ND	ND	ND	--	**1.6 J**	ND	ND	--	ND	ND	--	--
Benzo(ghi)perylene	**--**	ND	--	ND	--	ND	--	ND	ND	ND	--	1.3 J	0.5 J	ND	--	ND	0.65 J	--	--
Bis(2-ethylhexyl) phthalate	**5**	ND	--	ND	--	ND	--	12	ND	ND	--	**6.7 J**	1.7 J	ND	--	3.6 J	1.9 J	--	--
Chrysene	**0.002**	ND	--	ND	--	ND	--	ND	ND	ND	--	**1.1 J**	ND	ND	--	ND	ND	--	--
Di-n-butyl phthalate	**50**	0.44 J	--	0.29 J	--	0.31 J	--	ND	ND	ND	--	0.35 J	0.76 J	ND	--	ND	ND	--	--
Fluoranthene	**50**	ND	--	ND	--	ND	--	ND	ND	ND	--	2 J	ND	ND	--	ND	0.53 J	--	--
Indeno(1,2,3-cd)pyrene	**0.002**	ND	--	ND	--	ND	--	ND	ND	ND	--	**1.1 J**	ND	ND	--	ND	**0.49 J**	--	--
Pyrene	**50**	ND	--	ND	--	ND	--	ND	ND	ND	--	1.5 J	ND	ND	--	ND	ND	--	--
Tentatively Identified Compounds [7]	**--**	*20.5*	--	*318*	--	*62.8*	--	*336*	*ND*	*330 J*	--	*ND*	*21 B,J*	*72*	--	*403*	*324.6 B,J*	--	--
Total Metals (ug/L)																			
Aluminum - Total	**--**	869 J	320	2150 J	--	919 J	--	10900 J	250	1790 J	--	645 J	--	919 J	--	5520 J	--	300	--
Barium - Total	**1000**	65.2 J	66	164 J	--	272 J	--	166 J	100	121 J	--	133 J	--	83.9 J	--	153 J	--	68	--
Beryllium - Total	**3**	ND	ND	ND	--	ND	--	ND	ND	ND	--	1.2	--	ND	--	ND	--	ND	--
Cadmium - Total	**5**	**16**	4.2	ND	--	ND	--	ND	ND	ND	--	ND	--	ND	--	ND	--	4.3	--
Calcium - Total	**--**	193000 J	257000	265000 J	--	238000 J	--	229000 J	162000	158000 J	--	252000 J	--	157000 J	--	243000 J	--	263000	--
Chromium - Total	**50**	ND	ND	ND	--	ND	--	13.4 J	ND	ND	--	ND	--	ND	--	7.2	--	ND	--
Cobalt - Total	**5**	ND	ND	ND	--	ND	--	**6 J**	ND	ND	--	ND	--	ND	--	ND	--	ND	--
Copper - Total	**200**	ND	ND	ND	--	ND	--	10.4 J	ND	ND	--	ND	--	ND	--	ND	--	ND	--
Iron - Total	**300**	**798 J**	**820**	**1810 J**	--	**827 J**	--	**12900 J**	260	**1790 J**	--	**1570 J**	--	**1110 J**	--	**6250 J**	--	**830**	--
Lead - Total	**25**	ND	6.2	ND	--	ND	--	8.6	5.9	ND	--	11	--	ND	--	5.8	--	6.8	--
Magnesium - Total	**35000**	**54300 J**	**62100**	**49500 J**	--	**55200 J**	--	**47100 J**	**38900**	**49600 J**	--	**49500 J**	--	33300 J	--	**47400 J**	--	**62300**	--
Manganese - Total	**300**	169 J	**330**	256 J	--	**1060 J**	--	**646 J**	14	68.2 J	--	**3790 J**	--	45.8 J	--	**628 J**	--	**340**	--
Nickel - Total	**100**	ND	ND	ND	--	ND	--	11.8 J	ND	ND	--	ND	--	ND	--	ND	--	ND	--
Potassium - Total	**--**	6060	2000	3460	--	1610	--	4870 J	1100	2850	--	1600	--	1620	--	2820 J	--	2100	--
Selenium - Total	**10**	ND	ND	ND	--	ND	--	ND	ND	ND	--	ND	--	ND	--	ND	--	ND	--
Sodium - Total	**20000**	**256000**	**440000**	**525000 D**	--	**257000**	--	**33600**	**55200**	**34300**	--	**683000**	--	**115000**	--	**34700**	--	**446000**	--
Vanadium - Total	**14**	ND	ND	ND	--	ND	--	**19.5 J**	ND	ND	--	ND	--	ND	--	11.2 J	--	ND	--
Zinc - Total	**2000**	1350 J	75	ND	--	20.4 J	--	29.8 J	ND	ND	--	79.2 J	--	19.4 J	--	19.4 J	--	76	--
Pesticides and Herbicides (ug/L)																			
4,4'-DDD	**0.3**	0.037 J	--	ND	ND	0.019 J	ND	0.033 J	ND	0.071 J	ND	ND	--	ND	--	0.02 J	--	--	ND
4,4'-DDT	**0.2**	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	--	ND
alpha-BHC	**0.01**	ND	--	**0.014 J**	ND	ND	ND	**0.015 J**	ND	**0.015 J**	ND	ND	--	ND	--	**0.014 J**	--	--	ND
gamma-BHC (Lindane)	**0.05**	0.013 J	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	--	ND
gamma-Chlordane	**--**	ND	--	ND	ND	ND	ND	ND	ND	0.013 J	ND	ND	--	ND	--	ND	--	--	ND
Heptachlor	**0.04**	ND	--	ND	ND	0.02 J	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	--	ND
Heptachlor epoxide	**0.03**	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	--	ND
Field Measurements (Units as Indicated)																			
pH (units)	**6.5 - 8.5**	7.03	6.85	7.05	6.98	6.56	6.80	7.40	7.23	7.54	7.04	7.14	6.69	7.44	6.95	7.40	6.69	6.85	7.04
Temperature (oC)	**--**	19.7	18.4	21	12.2	19.4	12	15.2	13.3	14.7	19.1	22	15.2	17.2	14.1	15.2	15.2	18.4	19.1
Specific Conductance (uS)	**--**	2380	3553	3690	3604	2001	2909	1137	1366	1268	1306	4232	5691	1552	25.4	1137	5691	3553	1306
Turbidity	**--**	38	24.4	67	123	25.8	19.9	151	8.75	38.1	7.14	58	19.6	51	60.4	151	19.6	24.4	7.14
DO (ppm)	**--**	3.33	2.77	2.26	2.14	2.94	2.38	1.63	2.88	5.78	1.84	3.41	2.15	378	3.38	1.63	2.15	2.77	1.84
ORP (mV)	**--**	48	110	100	117	71	119	84	66	-25	62	0	137	54	77	84	137	110	62

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. Blind 1 is associated with MW-4D (9/27/10).
4. Blind 1 is associated with MW-103 (5/11/11).
5. Blind 2 is associated with MW-1D (5/11/11).
6. Blind 3 is associated with MW-5D (5/11/11).
7. Per the DUSR for May 2011 data; Most of the TIC determinations do not show the best library matches for most of the unknowns.
8. J = Estimated value.
9. B = Analyte was detected in the associated method blank.

Color Code:

= Result exceeds GWQS.

TABLE 5

SUMMARY OF RI SURFACE SOIL ANALYTICAL DATA (2010)

Remedial Investigation/Alternatives Analysis Report
500 South Union Street Site
Spencerport, New York

Parameter[1]	Unrestricted Use SCOs[2]	Groundwater Protection SCOs[2]	Commercial SCOs[2]	Remedial Investigation Data (August 2010)			
				SS-1	SS-2	SS-3	Blind Dup #1[3]
				08/31/10	08/28/10	08/31/10	08/28/10
Volatile Organic Compounds (VOCs) - mg/Kg							
Tentatively Identified Compounds	--	--	--	0.0081 B	ND	0.0084 B	ND
Semi-Volatile Organic Compounds (SVOCs) (mg/Kg)							
Acenaphthene	20	98	500	ND	ND	0.15 D,J	ND
Anthracene	100	1000	500	ND	ND	0.25 D,J	ND
Benzo(a)anthracene	1	1	5.6	1 D,J	1.4 D,J,T	1.2 D	1.5 D,J,T
Benzo(a)pyrene	1	22	1	1.5 D,J	ND	1.5 D	ND
Benzo(b)fluoranthene	1	1.7	5.6	1.6 D,J	2.3 D,J,T	1.6 D	1.7 D,J,T
Benzo(ghi)perylene	100	1000	500	1.4 D,J	1.5 D,J,T	0.96 D	1.7 D,J,T
Benzo(k)fluoranthene	0.8	1.7	56	0.98 D,J	ND	0.7 D,J	ND
Bis(2-ethylhexyl) phthalate	--	435	--	3.6 D	ND	ND	ND
Carbazole	--	--	--	ND	ND	0.24 D,J	ND
Chrysene	1	1	56	1.3 D,J	1.2 D,J,T	1.1 D	1.4 D,J,T
Dibenzofuran	--	--	350	ND	ND	0.14 D,J	ND
Di-n-octyl phthalate	--	--	--	1.1 D,J	ND	ND	ND
Fluoranthene	100	1000	500	2.7 D,J	2.6 D,J,T	2.7 D	2.7 D,J,T
Fluorene	30	386	500	ND	ND	0.11 D,J	ND
Indeno(1,2,3-cd)pyrene	0.5	8.2	5.6	1.1 D,J	ND	0.85 D,J	ND
Phenanthrene	100	1000	500	1.3 D,J	ND	2 D	ND
Pyrene	100	1000	500	2.1 D,J	1.8 D,J,T	2.1 D	2.1 D,J,T
Tentatively Identified Compounds	--	--	--	ND	ND	1.71	ND
Total Metals (mg/Kg)							
Aluminum - Total	--	--	--	4270 J	3860 J	6570 J	4250 J
Arsenic - Total	13	16	16	4.5 J	2.5 J	3.1 J	2.7 J
Barium - Total	350	820	400	33.1 J	22.4 J	36.9 J	23.9 J
Beryllium - Total	7.2	47	590	0.229	0.233	0.263	0.255
Cadmium - Total	2.5	7.5	9.3	0.508 J	ND	0.403	ND
Calcium - Total	--	--	--	40200 J	81200 D,J	7200 J	102000 D,J
Chromium - Total	30	--	1500	13.9 J	6.06	7.05	7.46
Cobalt - Total	--	--	--	3.36 J	2.86 J	4.23 J	3.25 J
Copper - Total	50	1720	270	21.7 J	9	23.1	10.3 J
Iron - Total	--	--	--	9650 J	7520 J	9110 J	8140 J
Lead - Total	63	450	1000	97.7 J	15.8 J	17.3 J	17.4 J
Magnesium - Total	--	--	--	16400 J	28200 J	3520 J	25700 J
Manganese - Total	1600	2000	10000	307 BJ	259 BJ	312 BJ	300 BJ
Nickel - Total	30	130	310	8.6	7.24	9.16	8.37
Potassium - Total	--	--	--	695	636	606	720
Sodium - Total	--	--	--	170	ND	ND	ND
Vanadium - Total	--	--	--	9.82	10	10.6	11.9
Zinc - Total	109	2480	10000	143 J	49.2 J	364 J	50.1 J
Mercury - Total	0.18	0.73	2.8	0.0315	0.02	0.0914	ND
Pesticides and Herbicides (mg/Kg)							
4,4'-DDE	0.0033	17	62	ND	ND	0.022 D,J	ND
4,4'-DDT	0.0033	136	47	ND	ND	0.024 D,J	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)
3. Blind Dup #1 is associated with SS-2.

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.
B = Analyte was detected in the associated Method Blank.
D = Compounds were identified in an analyisis at the secondary dilution factor.
T = Sample had an adjusted final volume during extraction due to extract matrix and/or viscosity.

= Result exceeds 6NYCRR Part 375 Unrestricted SCO.
= Result exceeds Protection of Groundwater Standard and Unrestricted SCO.
= Result exceeds 6NYCRR Part 375 Commercial SCO.

APPENDIX E

REGENESIS 3DME PRODUCT INFORMATION

3-D MicroEmulsion™ HRC ADVANCED®

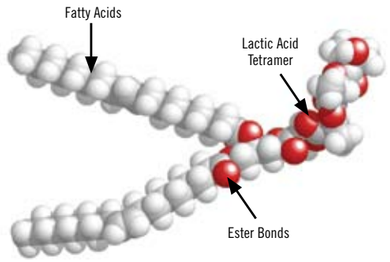
Achieve wide-area, rapid and sustai ned reductive dechlorination with continuous distribution and staged hydrogen release

3-D MicroEmulsion™ HRC ADVANCED®

PRODUCT FEATURES

- **Three Stage Electron Donor Release – Immediate, Mid-Range and Long-Term Hydrogen Production**
  - Provides free lactic acid, controlled-release lactic acid and long release fatty acids for effective hydrogen production for periods of up to 3 to 5 years.
- **Low-Cost**
  - 3-D Microemulsion is 25¢ to 42¢ 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.

FIGURE 1: THE 3-D MICROEMULSION MOLECULAR STRUCTURE



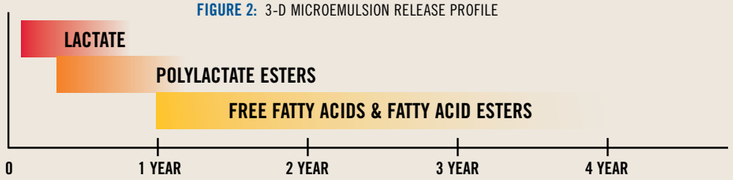
PRODUCT COMPOSITION

3-D Microemulsion (3DMe)™ is a form of HRC Advanced® and has a molecular structure specifically designed to maximize the cost-effective 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.

FIGURE 2: 3-D MICROEMULSION RELEASE PROFILE



APPLICATION AND DISTRIBUTION

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**.

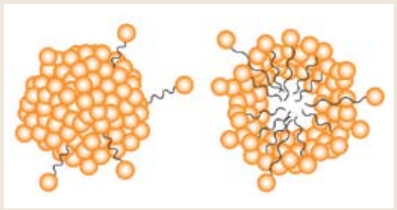
3DMe is typically applied in high-volumes as an emulsified, micellar suspension (microemulsion). The microemulsion is easily pumped into the subsurface and is produced on-site by mixing specified volumes of water and delivered 3DMe concentrate. Detailed preparation and installation instructions are available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



MORE ON APPLICATIONS

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

The microemulsion is easily prepared on-site and applied in high-volumes for maximum subsurface distribution.

3-D Microemulsion is typically applied through permanent wells or by using direct-push injection.

PERFORMANCE

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.

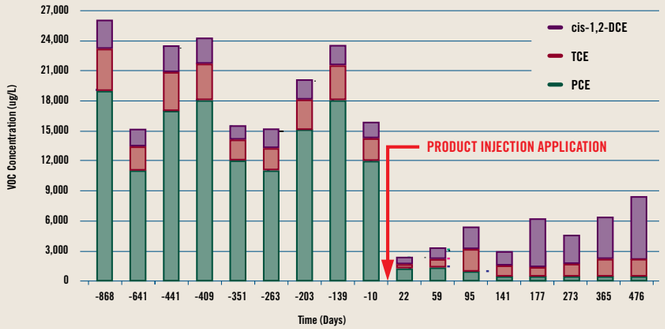


FIGURE 4: MW-16 CONTAMINANT CONCENTRATION DATA

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).

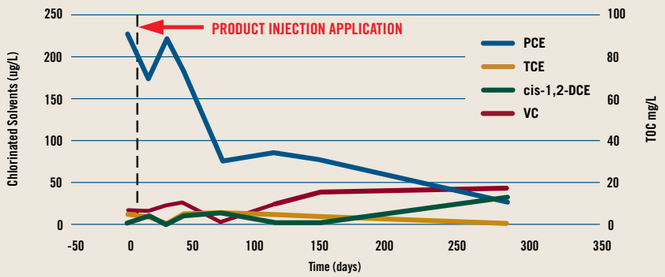


FIGURE 5: MW-103 CONTAMINANT CONCENTRATION DATA

PERFORMANCE

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 not temperature sensitive above 50ºF (10ºC). If the user plans to apply the product in cold weather, consideration should be given to warming the material to above 50ºF 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)

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.

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

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

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:

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).

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
    - range should be selected based on site specific requirements
- Pressure-Relief Valves for prevention of pressure buildup in various segments of the application tooling
    - 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:

1011 Calle Sombra
San Clemente, CA 92673

Phone: **949.366.8000**

Fax: **949.366.8090**

E-mail: **info@regenesis.com**

Chemical Name(s):	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**

Section 3 – Physical Data

Melting Point:	**Not Available (NA)**
Boiling Point:	**100 ºC**
Flash Point:	**> 93.3 ºC 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.**

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 exposure which elicits a reaction, a physician should be consulted immediately.

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:	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.