

excavation areas, a sample from soil boring B-14 from the Remedial Investigation, located in the south parking lot, had a PCE concentration of 1,800 µg/kg. This area, along with other soil and groundwater concerns outside of the primary source area, will be addressed in the remedial plan.

To assist in managing the excavation process, sections A and B are further divided into smaller excavation cells. Section A is divided into four cells and section B is divided into 2 cells. Each of the excavation “cells” will be created by installing an engineered slide rail shoring system around the perimeter of the targeted subsection to provide for a safe excavation (**Figure 4-6**). Since groundwater flow is to the south, soil will be excavated in stages from the north cells to the south cells to minimize re-contamination of soil and groundwater. Cell excavation will proceed in sequence as represented by the numerical designations shown in **Figure 3**. Due to the versatility of the slide rail system, limits of excavation areas may be extended based upon endpoint sample results, to ensure the removal of residually contaminated soils.

Each cell will be backfilled, compacted, and restored prior to excavation of the next cell. Following backfilling of the cells, the shoring system will be removed. As the excavation proceeds in each cell, groundwater present in the cell will be evacuated by pumping with surface pumps. Groundwater removed from the excavation will be filtered using a bag filter to remove fine soil particles and suspended materials and then treated using a shallow tray air stripper to remove VOCs to within discharge standards. The treated water will then be discharged to the Nassau County storm sewer system. See **Figure 7** for a flow diagram of the groundwater treatment system.

The excavated soil will be placed in constructed drying beds to remove excess water, and mixed with a drying agent, such as lime or kiln bottoms, as necessary, to meet the transportation and disposal requirements as a solid material. See **Figure 8** for details on the drying beds. The material will be analyzed according to the procedures described under section 4.3 of this Work Plan, to meet the waste acceptance criteria of the disposal facility. After characterization, the soil will be loaded into trucks for transport to a licensed off-site disposal facility, which meets all State and Federal standards. It is estimated that approximately 9,100 cubic yards of contaminated soil will be removed for disposal.

Soil may be treated within the drying beds using chemical oxidants or other methods to reduce VOCs to non-hazardous levels, or to remediate soils to within re-use guidance levels. The decision regarding treatment of excavated soils will be made by the Project Manager in consultation with and under the approval of, the NYSDEC.

Clean soil, when present above impacted soil, will be removed and stockpiled separately for return as backfill into the excavation. Excavated soil intended for return as backfill will be verified “clean” through a soil testing program, including analysis for VOCs, SVOCs, and metals, commensurate with the amount of soil under consideration and consistent with current guidance. Additional clean fill, as defined by 6NYCRR Part 360, may be brought in from off-site to backfill the excavations. The NYSDEC will be consulted, and must approve in advance, the return of excavated soil and the use of off-site fill. As part of the redevelopment plans for the site, excavations may not be completely filled, in order to allow for construction of a sub-grade parking garage. See **Figure 9** for a detail of the soil stockpile and **Figure 10** for the location of equipment and soil staging areas.

2.3 Dry Chemical Oxidation Treatment Within Excavation

Following excavation of soil down to the clay boundary, dry potassium permanganate will be placed in the excavation to address residual VOCs and to limit leaching from contaminants entrained in the clay. Potassium permanganate is a chemical oxidizer which will completely mineralize selected contaminants. Research has shown that potassium permanganate has been effective in soil and groundwater treatment for chlorinated solvents, such as PCE, and has been approved for use at hazardous waste sites by the NYSDEC and the USEPA. Potassium permanganate is highly effective on trichloroethene (TCE), PCE and chlorinated ethylenes, providing rapid treatment of these compounds in a predictable manner. Potassium permanganate will be added directly to the open excavation in powder form, prior to backfilling with clean soil. The powder will be mechanically dispersed at a rate of approximately 1.48 lbs/s.f.

Potassium permanganate is a safe product which has a long history of use in treating potable water supplies to remove iron, manganese, hydrogen sulfide and to generally improve taste and odor. Potassium permanganate is also commonly used in residential applications where it is installed as a pretreatment filter (greensand) to remove iron from private wells. See **Attachment A** for references on the use and application of potassium permanganate.

2.4 Spot Treatment Using Sodium Permanganate

To minimize the potential of upgradient PCE impacted groundwater from recontaminating excavated and backfilled cells, spot treatment using liquid sodium permanganate injections will be utilized at multiple locations to the north of the proposed excavation site.

Using direct push technology, approximately 5 gallons per linear foot, from the clay layer to six feet below land surface, of an 8% solution of potassium permanganate will be injected into the subsurface under an estimated pressure of 50 pounds per square inch. The injection points will be located in two “gates”, running perpendicular to the groundwater flow direction, to the north of the proposed “A and B” cells. The individual points will be located approximately 10 feet apart, and the second row of each “gate” will be offset five feet from the first row, to allow for subsurface “overlap” of chemical oxidation solution. See **Figure 3** for proposed sodium permanganate injection locations.

This series of spot injection treatments will occur during or before the excavation phase of the IRM. Based upon conditions encountered during excavation and/or additional site investigation, additional sodium permanganate injection treatment locations may be added. This injection treatment round is being conducted to assist in removing the primary PCE source area. Additional impacted soil and groundwater areas will be addressed under the remedial plan.

3.0 ENGINEERING SPECIFICATIONS AND CONTROLS

3.1 Engineering Specifications

3.1.1 Building Demolition

The building demolition and general site preparation will be conducted in two phases. Prior to initiating Phase 1, the demolition contractor with support, as needed, from the Engineer will perform or make arrangements to perform the following:

- Obtain a demolition permit from the Village of Rockville Centre
- Erect a temporary fence around the work area to make the site safe (existing chain link perimeter fence may be utilized as part of the fence).
- Prepare an erosion control plan in accordance with local requirements.
- Perform an Asbestos Containing Material (ACM) and Lead Based Paint (LBP) survey.
- Arrange for utility disconnects and verification.
- Arrange for the removal and disposal of identified ACM and LBP, if present.

Phase 1 of the demolition will include the following items:

- Demolish and remove the 80 Banks Avenue Building completely.
- Demolish and remove the 100 Banks Avenue office portion of the building completely.
- Gut the interior of the 100 Banks Avenue that is to remain until Phase 2 including the slab on grade.
- Misc site demolition of fences, dumpster enclosure, guard shack, signage, bollards, etc. Asphalt and curbs to remain at this time.

Phase 2 will be performed after Phase 1 is completed and may be performed after the IRM is completed to allow the stockpiling of soils, drying beds and other features either within the 100 Banks Avenue shell or on the building's slab. Phase 2 will consist of the following items:

- Demolish and remove the remaining portion of the 100 Banks Avenue building.
- Demolish and remove all curbs, sidewalks, paving, retaining walls, etc.

3.1.2 Mobilization and Site Preparation

Mobilization will include the delivery of construction equipment, support facilities and equipment and materials to the site. All construction personnel will receive site orientation and training in accordance with the site specific Health and Safety Plan, Community Monitoring Plan and established policies and procedures to followed during the implementation of Interim Remedial Measure. The remediation contractor and all associated subcontractors will each receive a copy of the Interim Remedial Measure Work Plan, Site Specific Health and Safety Plan and Community Monitoring Plan and will be briefed on their contents.

Site preparation will include the set-up of site support facilities consisting of a field office trailer, a personnel break trailer and portable sanitary facilities. Also included in the site preparation phase will be the construction of personnel and equipment decontamination stations, using HDPE and geotextile liners, installation of the groundwater treatment system and the construction of the drying beds and clean soil stock pile area. See **Figure 9** for a detail of the soil stockpile and **Figure 10** for the location of equipment and soil staging areas.

3.1.3 Clean Soil Area Construction

The clean soil area will consist of a 60 ft. x 100 ft. area capable of holding approximately 1,700 cubic yards of material. The area will be graded to promote positive drainage and will be lined with 20-mil polyethylene and surrounded by a silt fence. Stockpiled material will be covered with 20-mil polyethylene and secured until it is either removed from the site or returned to the excavation, if approved by the NYSDEC. See **Figure 9** for a detail of the soil stockpile and **Figure 10** for the location of equipment and soil staging areas.

3.1.4 “Dry” Excavation Methods

The “dry” excavation method is the technique of pumping water out of an excavation to allow the material to be removed in solid form, and to visually monitor the progress of the excavation.

Shallow excavations within the upper 4 feet of soil can be conducted without the need for bracing or dewatering. Beyond 4 feet, and below the water table of 9 feet, excavations will require shoring and bracing to ensure safety around the excavation. The shoring method selected for this project is the ICON Engineered Slide Rail System (see **Figures 5 and 6**). This system has several advantages over conventional shoring for this application. The slide rail system will be installed and removed using a tracked excavator or front-end loader, eliminating the need for a crane and pile driving equipment, and the potential for noise and vibration impact to the surrounding area. Since the slide rail system is installed incrementally during excavation, side wall samples can be collected as the excavation proceeds. This will provide advance warning of the presence of impacted soil adjacent to the planned excavation area. If this occurs, the system can be expanded to include the adjacent area, something that could not be easily accomplished with conventional shoring. Another significant advantage of the system, for this project, is that it does not have to penetrate into the clay surface or beyond the excavation depth since the walls are braced internally.

Dewatering of the excavation will begin at the water table (approximately 9 feet below grade) using a surface pump. It is anticipated that approximately 290,000 gallons of groundwater will be removed from the excavations at a flow rate of from 1 to 20 gpm. Discharge water will be pumped into a weir tank to remove sediments and then through a shallow tray air stripper to reduce VOCs to required standards and then routed to the Nassau County storm drain system. See **Figure 7** for a flow diagram of the groundwater treatment system. Groundwater extraction rates of 1 to 20 gallons per minute (gpm) are anticipated. The air stripper specified is a North East Environmental Products shallow tray air stripper, model number 2331-P, capable of handling flow rates to 50 gpm. A copy of the air stripper’s physical and performance specifications is included in **Attachment B**. If groundwater dewatering occurs at a rate that exceeds the capacity of the air stripper, one or more 20,000 gallon holding tank may be used to temporarily store water prior to treatment or prior to discharge. During dewatering activities, air monitoring, as per the CAMP, will be conducted to ensure that impact to

nearby community receptors is within allowable levels. If action levels are exceeded during these activities, engineering controls such as exhaust pollution control devices, will be used to reduce air emission levels to within acceptable levels.

3.1.5 “Flooded” Excavation Methods

Past the depth where the dry excavation could be unstable due to “bottom heave”, it may be necessary to reduce the rate of dewatering and thus decrease the differential water pressure in the excavation. The soil would be excavated with a low solids content and transferred to the drying beds for removal of excess water. These conditions are not expected to occur due to the shallow depth of the excavation and the presence of the clay layer.

3.1.6 Drying Bed Construction

Soils excavated below the water table will be drained to remove excess water and achieve the solids content required by the disposal facilities. The removal of excess water will be accomplished by placing soil excavated below the water table in drying beds that will be constructed on the site.

Two drying beds will be utilized, with a combined area of 110 by 220 feet, and consist of a polyethylene plastic liner with bermed side walls. The bottom of the beds will be sloped so that when the water drains from the soils by gravity the water can be collected and treated through the air stripper. See **Figure 8** for drying bed construction details.

Excavated soil will be placed in the beds in 1 foot lifts and spread with a bulldozer. Wet soil may be mixed with drier soil to reduce the use of drying agents. If soils do not achieve the required solids content, as determined by the Paint Filter Test (EPA SW-846 Method 9095), a drying agent such as High Calcium Chemical Pebble Lime will be used.

Based on experience from similar projects, it is estimated that soils will remain in the drying bed for 5 days. Two beds will be utilized and will be managed so that while one bed is full, the other bed is available to receive soils. Each bed can contain approximately 1,800 cubic yards, and it estimated that each bed will be filled and emptied approximately three times during the project.

3.1.7 Disposal

Impacted soil and sediment from the weir tank will be sampled in accordance with the procedures described under **Section 4.3** of this document to meet the waste acceptance criteria of the disposal facility. Impacted soil to be removed from the site will be loaded into polyethylene-lined 18-wheeled dump trailers provided by a licensed hazardous waste transport company. Loading will be performed with a front-end loader equipped with load scales to ensure that each vehicle is properly loaded and within the weight limit. Loaded trailers will be covered with a tarp and may be sprayed prior with a seedless hydro-mulch product or an encapsulating foam to seal odors.

The proposed disposal facility is the Waste Management Model City Facility in Buffalo, NY. The trip to this facility will take approximately one day. To prevent a two-day hold over for trucks arriving at the facility after hours on a Friday, loading and transport will be limited to Monday through Thursday. It is estimated that approximately 541 loads will be shipped from the site at an average weight of 22 tons per load.

Soil may be treated within the drying beds using chemical oxidants or other methods to reduce VOCs to non-hazardous levels or to remediate soils to within re-use guidance levels.

3.1.8 Backfill and Site Restoration

Following collection of verification samples and the installation of dry potassium permanganate within the excavations, the excavations will be backfilled and compacted with clean fill. Clean soil, when present above impacted soil, will be removed and stockpiled separately for return as backfill into the excavation. Excavated soil intended for return as backfill will be verified “clean” through a soil testing program commensurate with the amount of soil under consideration and consistent with current guidance. Additional clean fill, as defined by 6NYCRR Part 360, may be brought in from off-site to backfill the excavations. The NYSDEC will be consulted, and must approve in advance, the return of excavated soil and the use of off-site fill.

As part of the redevelopment plans for the site, excavations may not be completely filled in order to allow for construction of a subsurface garage. Site restoration will be performed as per the redevelopment plans for the site.

Open excavations will be enclosed with fencing and monitored by a security service during off-work hours to limit access to the excavations by the public.

3.1.9 Dismantling Plan

Following the completion of interim remedial activities at the site, all equipment and remedial structures will be dismantled and removed from the site. The air stripper will be decontaminated, dismantled, and removed from the site.

The drying beds will be dismantled and removed by cutting the polyethylene plastic liner into smaller sheets and disposed of at the same landfill where the soils were disposed.

3.2 Engineering Controls

3.2.1 Dust Suppression

Dust generation will be minimized during excavation, loading, hauling, and dumping since the majority of the excavated material will be wet. Dry soils, free of contamination, will be stockpiled on site for return into the excavation subject to NYSDEC approval. Dust generation from stockpiled soils will be monitored as described under *Section 4.0 Monitoring and Maintenance*. If dust generation approaches action levels, suppression will be accomplished by the use of a water truck(s). Over application of water resulting in free liquids will be minimized due to additional requirements for handling surface runoff. Clean stockpiles and other work areas that have the potential of generating dust will require spraying with a water truck at the end of each work day, and as deemed necessary by the Supervisor. Contaminated dry soil, will be loaded directly into trucks for immediate off-site disposal.

3.2.2 Odor Control

The primary technique to be implemented for control of volatile organic odors from stockpiled soil loaded trucks or the open excavation will be the application of a hydro-mulch material or

encapsulating foam sealant. The hydro-mulch material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch or the encapsulating sealant will be sprayed over open excavation areas, temporary stockpile areas, drying beds and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source. Additional steps for odor control around the excavation may include the installation and operation of a water curtain. As a final control, excavation will be limited to favorable wind and temperature conditions to minimize off-site odor migration.

During times that a vacuum truck or shallow tray air strippers are being used to remove DNAPL from wells or open excavations or treat water prior to discharge, air monitoring, as per the CAMP, will be conducted to ensure that impact to nearby community receptors is within allowable levels. If action levels are exceeded due to these activities, engineering controls such as exhaust pollution control devices will be used to reduce air emission levels to within acceptable levels. See **Figure 7** for a flow diagram of the groundwater treatment system.

3.2.3 Wastewater from Drying Beds

During and upon completion of drying of contaminated soils, wastewater generated from the drying beds will be pumped to holding tanks. The wastewater will then be treated using the shallow tray air stripper from the dewatering operations and discharged to the NC storm drain system.

3.2.4 Stormwater Management

Efforts will be made to prevent stormwater pollution from occurring due to project work. During excavation activities, stormwater runoff from excavation areas will be minimized by using proper control measures such as silt fences, as well as the shoring system. Upon completion of excavation activities, the excavated areas will be backfilled, as appropriate, to redevelop the area as per the development plans.

Stockpiles and drying beds will be covered during inclement weather to prevent infiltration of stormwater.

3.2.5 Security and Fencing

Orange safety fencing will be installed around open excavations to ensure on-site worker safety and to restrict access to the excavations by the public. Open excavations will be monitored by a security service during off-work hours to limit access to the area by the public. Security during the excavation of area "C" will be particularly stringent, due to the proximity to Morgan Days Park.

4.0 MONITORING AND MAINTENANCE

4.1 Construction Phase Monitoring

Monitoring during soil excavation will be performed to protect the health of site workers and the surrounding community. A Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) have been developed for this project. These plans specify the monitoring procedures, action levels, and contingency measures that are required to protect public health. Generally, air monitoring would include real-time measurement of volatile emissions and dust levels.

4.2 Post-Excavation Monitoring and Verification

The verification sampling of the excavated areas will be performed prior to the addition of dry potassium permanganate to document that cleanup goals are being met.

As recommended by NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, the verification sampling approach will consist of collecting samples from each excavated cell (A1 through A4, B1, B2, and C). The sampling frequency will be one sample from the bottom of each sidewall for every 30 linear feet of sidewall, excluding sidewalls shared with other sections, and one sample from the excavation bottom for every 900 square feet of bottom. Shared sidewalls will be removed during excavation of the next section, and therefore does not require sampling. A drawing depicting locations of proposed verification samples is provided in **Figure 11**.

Verification soil samples will be submitted to a NYSDOH certified analytical laboratory for analysis of VOC compounds according to EPA method 8260B in accordance with NYSDEC Analytical Sampling Protocol with Category-B deliverables (ASP-B) and third party data validation. The QA/QC program will include the preparation and analysis of field and laboratory QA/QC samples such as, trip blanks and matrix spike duplicates.

Soil sampling and equipment decontamination will be performed in accordance with USEPA *SOP # 2001 General Field Sampling Guidelines*, *SOP# 2012 Soil Sampling*, and *SOP# 2006 Sampling Equipment Decontamination*.

4.3 Waste Characterization

The initial waste characterization will be performed by collecting a composite soil sample from drill cuttings obtained during the installation of the DNAPL extraction wells. Sample analysis will be as specified by the requirements of the disposal facilities waste acceptance criteria (WAC). After the results of the analysis are complete, the remediation contractor will prepare a Waste Profile form which will be signed by the by the property owner. This form will then be submitted to the waste disposal facility for evaluation and final approval.

Waste soil samples will be collected from the drying beds at a rate of one per 250 cubic yards and submitted to a NYSDOH certified analytical laboratory for analysis of PCE as required by the facilities WAC. Analysis for waste characterization will be provided in a results-only format.