# REMEDIAL ALTERNATIVES ANALYSIS & REMEDIAL ACTION WORK PLAN

ECL Article 27/Title 14

1440 Empire Boulevard
Town of Penfield, New York

NYSDEC Site #C828135

**Prepared for:**

1440 Empire Boulevard Development Corporation

**Prepared by:**


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October 24, 2012 P.N. 20229.0017

# CERTIFICATIONS

I, Gary Passero, certify that I am currently a NYS registered professional engineer and that this plan 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).

I certify that the site description presented in this Remedial Action Work Plan (RAWP) is identical to the site descriptions presented in the Brownfield Cleanup Agreement for 1440 Empire Boulevard in the Town of Penfield and related amendments.

I certify that this RAWP includes proposed use restrictions, Institutional Controls, Engineering Controls, and plans for all operation and maintenance requirements applicable to the Site and provision for development of an Environmental Easement to be created and recorded pursuant ECL 71-3605 [if Track 1 is not achieved]. This RAWP requires that all affected local governments, as defined in ECL 71-3603, will be notified that such Easement has been recorded. This RAWP requires that a Site Management Plan must be submitted by the Applicant for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, for approval by the Department [if Track 1 is not achieved].

I certify that this RAWP has a plan for import of all soils and other material from off-Site and that all activities of this type will be in accordance with all local, State and Federal laws and requirements.

I certify that that this RAWP has a plan for nuisance control during the remediation and all invasive development work, including a dust, odor and vector suppression plan and that such plan is sufficient to control dust, odors and vectors and will prevent nuisances from occurring.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

| 047268 | 10·23·12 | Gary W. Passero |
|---|---|---|
| NYS Professional Engineer # | Date | Signature |

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

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## APPENDICES

## 1.0 INTRODUCTION

This Remedial Alternatives Analysis (RAA) and Remedial Action Work Plan (RAWP) provides a summary of remedial alternatives evaluated and selects remedial actions to be implemented for the Brownfield Cleanup Program (BCP) Site at 1440 Empire Boulevard in the Town of Penfield, New York (NYSDEC Site #C828135) (herein, the "Site"). The Site is an approximately 4.4-acre portion of a larger 16.67-acre parcel. The Site is zoned for commercial and residential use and is located on the northern side of Empire Boulevard (NYS Route 404) at the southern end of Irondequoit Bay in the Town of Penfield, Monroe County, New York (Drawing 1).

## 2.0 BACKGROUND

The Site is a grass-, brush-, and tree-covered undeveloped parcel. It is identified in the Town of Penfield's 2010 Draft Comprehensive Plan as being designated for mixed use purposes. The east shore of Irondequoit Bay is approximately 700 feet west of the Site. The Site is located approximately 0.5 miles south of the Empire Boulevard intersection with Plank Road in an area designated by the Town as the LaSalle's Landing District. The Town of Penfield permits the following Principal Uses, and any combination thereof, in the LaSalle's Landing District:

| | |
|---|---|
| -Multi-Family Dwellings | -Offices |
| -Townhouses | -Stores, Shops and Boutiques |
| -Restaurants | -Parks |
| -Motels & Hotels | -Public Buildings |

The majority of the Site ground surface and sub-surface is influenced by historical fill materials deposited on the Site. The Site slopes steeply downward to the east from its eastern boundary to a much more gradual slope which runs across the center of the Site. Steep slopes and small gullies are found along the northern and northwestern site boundaries. The southwestern part of the Site has a gentle northward slope. Passing southeast to northwest through the center of the Site there is a shallow, narrow, intermittent, fully vegetated stream. The ground surface is littered with potholes caused by the subsidence of the debris fill and the random nature of the debris placement. The potholes provide a conduit for storm water to infiltrate the ground surface.

According to Mr. James Costello, of the Town of Penfield Department of Planning and Development, a portion of the Site was used as a sand quarry and an unpermitted disposal area for construction and demolition (C&D) debris from the late 1940s to the early 1980s. Mr. Costello stated that previous Site owners were taken to court by the Town of Penfield in the early 1980s to address the unpermitted dumping. At that time, the restoration of the "Olde Rochesterville Apartments" was occurring in the City of Rochester, and the Site owners allowed the Site to be used as a C&D disposal property as part of that reconstruction project.

The Site is now proposed to be part of a 358-unit multi-family (apartments) development. There will be no single-family dwellings.

## 3.0 SUMMARY OF THE REMEDIAL INVESTIGATION & AREAS OF CONCERN

Soils

The Remedial Investigation (RI) of the Site resulted in the identification of semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), metals, and pesticides at concentrations that exceed the New York State Department of Environmental Conservation (NYSDEC) Unrestricted Use Soil Cleanup Objectives (SCOs) and Restricted Use, Restricted Residential SCOs as set forth in 6 NYCRR Part 375-6.8(a) and Part 375-6.8(b), respectively. Based on the results of the RI, it appears that the historical sand quarry was excavated to approximately 35 feet below the present ground level in the general area of boring location BH-3, and later filled with construction debris. While some household garbage might have disposed of on the Site, if so it is believed to be very limited, as soil borings and test pits did not encounter identifiable solid waste. Site soils in Area of Concern (AOC) 1 (AOC-1) and AOC-2 have been determined to contain SVOCs, PCBs, pesticides, and metals at concentrations that exceed one or more of the default, numeric criteria listed in the Unrestricted and Restricted Use, Restricted Residential SCOs.

Based on an areal extent of approximately 84,600 square feet and an average depth of 25 feet, the volume of fill material in AOC-1 is estimated to be 78,000 cubic yards. Based on an areal extent of approximately 105,400 square feet and an average depth of eight feet, the volume of fill material in AOC-2 is estimated to be 31,230 cubic yards. In sum, a total estimated volume of 109,230 cubic yards of fill and contaminated fill is present at the Site. This volume was determined through an evaluation of contaminant distribution in soil borings and test pits combined with observations made during the investigation of the Site. The location and extent of AOC-1 and AOC-2 are presented on Drawing 2.

### Groundwater

The direction of groundwater flow, as calculated during the September 2010 sampling event, has been measured to be toward Irondequoit Bay to the west. Groundwater samples collected from the Site contain chlorobenzene, alpha- and delta-BHC, and various metals at concentrations greater than the NYS Part 703 Groundwater Quality Standards.

Chlorobenzene was reported in groundwater collected from location MW-3 at a concentration of 5.06 micrograms per liter (µg/L) during the January 2010 sampling event though it was not detected during the September 2010 sampling event in this same location. Chlorobenzene was reported at a concentration of 5.35 µg/L in groundwater collected from MW-1 in the September 2010 sampling event but was not detected in the January 2010 sampling event. The Groundwater Quality Standard for chlorobenzene is 5 µg/L. The inconsistent detection of chlorobenzene just slightly above the Groundwater Quality Standard does not appear to indicate a significant release to groundwater.

The pesticide alpha-BHC was detected in groundwater at concentrations ranging from 0.0548 µg/L to 0.056 µg/L, slightly greater than the Groundwater Quality Standard of 0.01 µg/L. The pesticide delta-BHC was detected in groundwater at concentrations ranging from 0.0541 µg/L to 0.056 µg/L, slightly greater than the Groundwater Quality Standard of 0.04 µg/L. These low concentrations of pesticides were detected in groundwater collected from four of five monitoring wells. Historical aerial photographs indicate that the land upgradient to the east of the Site was historically utilized as orchards. These pesticides are interpreted as potentially being due to historical pesticide application to the nearby orchards, and not as a release on the Site. Additionally, they may be a result of the disposal of materials with pesticide residue.

Metals concentrations were elevated in groundwater collected from all five monitoring wells when compared to Part 703 Groundwater Quality Standards, but these concentrations appear to be a natural occurrence, since elevated metals were found in both upgradient and downgradient monitoring wells. Further, the elevated concentrations may be attributable to elevated turbidity of groundwater at the time of sample collection.

The concentrations of these constituents at the assumed discharge point in Irondequoit Bay are presumably much lower than what was found on Site due to natural attenuation and dilution processes. The low contaminant concentrations found in the groundwater in monitoring wells at the property boundaries of the site do not appear to indicate a groundwater plume emanating from the Site.

There are no public water supply wells located within one-half mile of the Site (EPA/Office of Drinking Water). There are no private wells, as the area is serviced by Monroe County Water Authority (MCWA).

**Other Media**

The RI did not identify any other media of concern. A sample taken from an intermittent creek, which traverses the central portion of the Site before discharging into the ground surface in the north central portion of the Site did not show any exceedance of 6 NYCRR Part 703 Surface water Quality Standards for VOCs, SVOCs, pesticides, PCBs or metals. Due to the absence of volatile organic compounds in site soil and/or groundwater, a soil vapor intrusion evaluation is not warranted.

**Risk Assessment**

Access to the site is unrestricted. However, contact with contaminated soil or groundwater is unlikely unless people dig below the ground surface. People are not coming into contact with the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. The future proposed use of the Site would restrict access and prevent exposure to contaminated subsurface soils through the use of institutional controls.

## 4.0 REMEDIAL ACTION OBJECTIVES (RAOs)

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been established for this Site.

### *4.1 Groundwater*

**RAOs for Public Health Protection**

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with contaminated groundwater.

**RAOs for Environmental Protection**

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground water contamination.

### *4.2 Soil*

**RAOs for Public Health Protection**

- Prevent ingestion/direct contact with contaminated soil.

**RAOs for Environmental Protection**

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

## 5.0 OBJECTIVES

The objective of this RAA is to evaluate remedial alternatives to address the contaminants of concern at the Site as presented above and to select the most appropriate remedy that is protective of human health and the environment and ensures short- and long-term effectiveness, in light of cost and future use of the Site. As defined in NYSDEC DER-10 (Section 4.2), remedial alternatives shall be evaluated based on the following criteria:

*1.)* *Overall Protection of Public Health and the Environment* - This criterion evaluates exposure and residual risks to human health and the environment during or subsequent to implementation of the alternative.

2.) *Compliance with Standards, Criteria and Guidance (SCG)* - This criterion evaluates whether the remedial alternative will ultimately result in compliance with SCG, to the extent practicable.

3.) *Long-Term Effectiveness and Permanence* - This criterion evaluates if the remedy is effective in the long-term after implementation (e.g., potential rebound). In the event that residual impacts will remain as part of the alternative, then the risks and adequacy/reliability of the controls are also evaluated.

4.) *Reduction of Toxicity, Mobility, or Volume with Treatment* - This criterion evaluates the reduction of contaminant toxicity, mobility or volume as a result of the remedial alternative. In addition, the reversibility of the contaminant destruction or treatment is evaluated.

5.) *Short-Term Effectiveness* - This criterion evaluates if the remedial alternative protects the community, workers and the environment during implementation.

6.) *Implementability* - This criterion evaluates the remedial alternative based on its suitability, implementability at the specific site, and availability of services and materials that will be required.

7.) *Cost* - This criterion evaluates the capital, operation, maintenance, and monitoring costs for the remedial alternative. The estimated costs are presented on a present worth basis.

8.) *Community Acceptance*-This criterion evaluates if the remedial action is likely to be viewed favorably by the community at large.

9.) *Land Use*- This criterion evaluates the consistency of the remedial action with the reasonably anticipated future land uses of the site and its surroundings.

## 6.0 DEVELOPMENT OF REMEDIAL ALTERNATIVES

This section includes the rationale for the remedial alternatives being considered for addressing the contaminants identified at the Site. The Site is proposed to be developed by the construction of apartment buildings with asphalt driveways and parking lots, as indicated on Drawing 2. The remedial alternatives evaluated are summarized below. As the remediation of AOC-1 and AOC-2 will be performed concurrently and in a similar fashion, one evaluation pertains to both areas

The proposed remedy is a Track 4 Cleanup that will cap all remaining soils with contamination levels that exceed Part 375 Restricted Use, Restricted Residential Soil Cleanup Objectives (SCOs). When remediation is complete, exposure to any soils remaining at the Site with concentrations greater than SCOs would be prevented by a cover. Penetration of the cover will only be allowed through compliance with an approved Site Management Plan (SMP) and Health and Safety Plan (HASP) that protects workers from exposure.

Based on the nature of contaminants present at the Site, all alternatives proposing a remedial action include the excavation of contaminated soils based on the level of PCBs and lead. Any PCBs encountered during excavation will, at a minimum, be handled in accordance with the presumptive remedy set forth in paragraph V(I)(2) of NYSDEC Commissioner's Policy CP-51, which requires removal of PCB contamination above 10 ppm, and does not allow surface soil contamination greater than 1 ppm. Further, soils with PCB contamination level of greater than 50 parts per million (ppm) will be treated as hazardous waste and transported to a hazardous waste treatment or disposal facility. During the RIR and previous testing in 2002, several areas within the BCP Site were identified as having a PCB contamination level of greater than 10 ppm. These included TP-2A (28.0 ppm) and TP-5A (83.9 ppm) in 2002, and TP-7 (13.0 ppm) GP-7 (18.1 ppm) in 2009/2010.

The RIR identified three areas with lead concentrations exceeding the restricted residential SCOs (400 ppm or higher) set forth in 6 NYCRR Part 375-6.8(b): GP-2 (2140 ppm), which is slightly off-site; BH-3 (3450 ppm, 4 ft. to 6 ft. depth); and GP-10 (1060 ppm). All soils with contamination of at least 400 ppm will be excavated and disposed of off-site.

1. *Impacted Soils Left In-Place* - **No Action:**

   The no-action alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur. No environmental easement would be recorded to run with the land including institutional or engineering controls to further manage residual contamination. The Site would remain virtually unchanged and change in use would not be limited except by existing land use controls such as zoning.

2. ***Soil capping, partial soil excavation with disposal offsite and Site Management Plan with Institutional Controls*:**

   Under this Track 4 cleanup alternative (detailed on Drawing 3), the Site would be designated for restricted residential use, and all soils with PCB levels at or above 10 ppm or lead levels at or above 400 ppm would be removed and disposed of offsite in a permitted solid waste landfill as discussed below (except any soils with PCB contamination above 50 ppm would be managed as hazardous waste). Approximately 20,000 cubic yards of soil from AOC-1 and AOC-2 would also be removed to achieve the grades required to develop the Site and would be disposed of offsite in a permitted landfill. All remaining disturbed soils in AOC-1 and AOC-2 (including soils contaminated with PCBs below 10 ppm) would be capped with either asphalt, a concrete building slab, or a minimum of two feet of clean soil cover. Institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a SMP including a HASP would be implemented to protect against exposure and also would control Site use. In addition to the excavations required for foundations, roadways and utilities, the areas to be capped with clean soil would also be over excavated two feet to allow for placement of the clean soil cap. The clean soils used for the cap would be imported from a location off site, i.e. a different construction site. The estimated volume of clean soils required for the cap under this alternative is approximately 5,185 cubic yards (70,000 sf of lawn area).

At the beginning of the remediation, areas with PCB contamination above 10 ppm would be identified using conventional survey equipment and re-tested for PCB concentration levels using field based screening methodologies. Based on the results of the sampling, these soils would then be handled in accordance with CP-51 and as specified in this plan. Once an area was identified as containing soils with a PCB level of 10 ppm or greater, it would be excavated and hauled to an approved solid waste landfill (unless it is 50 ppm or greater and then would be managed as hazardous waste). Once removed, the sidewall and bottom of the excavation would be sampled in accordance with Section 5 of DER-10 to ensure that the residual soils have contamination levels below 10 ppm. If not they would be excavated and the process repeated. If appropriate, a grid pattern will be developed to further delineate the area that must be excavated.

Excavated soils with a PCB level of 10 ppm or greater would be temporarily stockpiled within the BCP Site prior to exportation. The stockpile of waste would be separate from the stockpile of materials with a contamination level less than 10 ppm. If any soils are encountered with a PCB level of 50 ppm or greater, these soils would be placed in a third stockpile. The stockpiles would be marked in the field with signage indicating either "Solid Waste," "Hazardous Waste" or "Soils for Reuse."

Similar to the approach with PCB contaminated soils, at the onset of the cleanup areas with lead contamination of 400 ppm or greater would be located in the field using conventional surveying equipment. These soils would then be excavated and screened. Any soils with a contamination level above 400 ppm would be temporarily placed in a "Solid Waste" stockpile and then exported from the Site to an approved landfill. After the excavation of the soils is complete, the sidewalls and bottom of excavation would be sampled to ensure residual soils have contamination levels below 400 ppm.

All stockpiles would be equipped with appropriate erosion control measures including but not limited to silt fencing and straw mulch stabilization.

The importation and export of soils to and from the BCP Site is subject to sampling requirements and restrictions detailed in Section 5.4 of DER-10. A borrow pit is not proposed under this alternative.

Cleanup Objectives:

1. *Overall Protection of Public Health and the Environment*
2. *Compliance with Standards, Criteria and Guidance (SCG)*
3. *Long-Term Effectiveness and Permanence*
4. *Reduction of Toxicity, Mobility, or Volume with Treatment*
5. *Short-Term Effectiveness*
6. *Implementability*
7. *Community Acceptance*
8. *Land Use*

3. ***All Soils in AOC excavated for off-site disposal:***

Under this alternative (detailed on Drawing 4), all soils in AOC-1 and AOC-2 contaminated above Track 2 restricted residential SCOs set forth at 6 NYCRR Part 375-6.8(b) (including 1 ppm for PCBs, and 400 ppm for lead) would be excavated for off-site disposal at a permitted landfill as a non-hazardous waste (except any soils with PCB contamination above 50 ppm would be managed as hazardous waste). Based on the RI data, and using the assumption that the fill soils do not contain PCBs at concentrations greater than 50 milligrams per kilogram, a remediation approach of excavation and off-site disposal has been analyzed for AOC-1 and AOC-2. Based on the assumption that approximately 110,000 cubic yards of soil and fill are present in AOC-1 and AOC-2, and a conversion factor of 1.6 tons per cy of soil, approximately 176,000 tons of soils would require excavation for off-site disposal. Under this scenario, excavation and off-site disposal would require approximately four months to complete.

The export of soils to and from the BCP Site is subject to sampling requirements and restrictions detailed in Section 5.4 of DER-10.

Cleanup Objectives:

1. *Overall Protection of Public Health and the Environment*
2. *Compliance with Standards, Criteria and Guidance (SCG)*
3. *Long-Term Effectiveness and Permanence*
4. *Reduction of Toxicity, Mobility, or Volume with Treatment*
5. *Short-Term Effectiveness*
6. *Implementability*
7. *Community Acceptance*
8. *Land Use*

4. ***Impacted soils excavated for onsite management and Site Management Plan with Institutional Controls*:**

Under this alternate Track 4 cleanup alternative (detailed on Drawing 5), the Site would be designated for restricted residential, and all soils with PCB levels at or above 10 ppm or lead levels at or above 400 ppm would be removed and disposed of (as discussed above) in a permitted solid waste landfill as discussed below (except any soils with PCB contamination above 50 ppm would be managed as hazardous waste). A portion of the other soils in AOC-1 and AOC-2 would be excavated to allow for the construction of the proposed buildings and subsequent infrastructure including roadways, parking lots, and utilities and buried onsite in the Borrow Pit area as discussed below. Based on preliminary estimates, approximately 20,000 cubic yards of material would have to be removed from AOC-1 and AOC-2 in order to achieve the grades required to develop the Site. All remaining disturbed soils in AOC-1 and AOC-2 (including soils contaminated with PCBs below 10 ppm) would be capped with either asphalt, a concrete building slab, or a minimum of two feet of clean soil cover (demarcated with an orange snow fence). Institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a SMP including a HASP would be implemented to protect against exposure and also control site use.

This alternative is the same as Alternative 2 except that under this alternative, the soils excavated from AOC-1 and AOC-2 following the PCB and lead contaminated soil removal would be placed in a Borrow Pit, within the limits of the BCP Site, in an area immediately adjacent to the AOC (Drawing 5) and not hauled to a landfill. The clean soils in the Borrow Pit would be excavated and used as structural fill and for the two-foot cap on disturbed areas in the AOC. Soils excavated and removed from the Borrow Pit for use in the two-foot cap would be sampled and approved in accordance with Section 5.4 of DER-10, and must meet restricted-residential soil cleanup objectives under 6 NYCRR Part 375-6.8. The estimated volume of soils required for the cap is 5,185 cy. About 15,000 cy of additional soils from the Borrow Pit will be utilized in other areas of the development off the BCP Site, if after being sampled and approved in accordance with Section 5.4 of DER-10, the soils meet unrestricted standards. If sufficient soils meeting restricted residential standards under 6 NYCRR Part 375-6.8 are not available for the cap, soils meeting those standards, and sampled and approved in accordance with Section 5.4 of DER-10, would be imported from off-site.

The void created from the removal of the clean soils would then be filled using the excavations from AOC-1 AOC-2. Prior to placement in the Borrow Pit, the contaminated soil removed from AOC-1 and AOC-2 would be placed in stockpiles situated within the BCP Site. The stockpiles would be equipped with appropriate erosion control measures including but not limited to silt fencing and straw mulch stabilization. Stockpiled soils that do not require off-site disposal would then be preferentially used within the limits of the BCP Site for backfill below hard cover areas (structures/parking areas) and below the two foot soil cover where soils would be exposed.

Any of these stockpiled soils not placed back in the developed area within the AOC would then be placed in the Borrow Pit.. After the earthwork is completed, all soils placed in the Borrow Pit would then be capped with two feet of clean soils. The clean soils used for the two foot cap in the Borrow Pit would be soils that are initially excavated from the Borrow Pit and stockpiled outside the limits of the BCP Site.

If the volume of soil excavated from the AOC exceeds the volume of the Borrow Pit, then the excess will be hauled off site to an approved landfill or to another area approved by NYSDEC for contaminated soil disposal or re-use.

The importation and export of soils to and from the BCP Site is subject to sampling requirements and restrictions detailed in Section 5.4 of DER-10.

During excavation, any identifiable solid waste, and non-exempt construction and demolition debris (as defined by 6 NYCRR Part 360-7), would be segregated for off-site disposal.

At the beginning of the remedial clean up, areas with PCB contamination of 10 ppm or greater would be identified using conventional survey equipment and re-tested for PCB concentration levels. Based on the results of the sampling, these soils would then be handled in accordance with CP-51 and as specified in this plan.

Once an area was identified as containing soils with a PCB level of 10 ppm or greater, it would be excavated and hauled to an approved solid waste landfill (unless it is 50 ppm or greater and would then be managed as hazardous waste). Once removed, the sidewall and bottom of the excavation would be sampled in accordance with Section 5 DER-10 to ensure that the residual soils have contamination levels below 10 ppm. If not they would be excavated and the process repeated. If appropriate, a grid pattern would be developed to further delineate the area that must be excavated. Excavated soils with a PCB level of 10 ppm or greater would be temporarily stockpiled within the BCP Site prior to exportation. The stockpile of waste would be separate from the stockpile of materials with a contamination level less than 10 ppm. If any soils are encountered with a PCB level of 50 ppm or greater, these soils would be placed in a third stockpile. The stockpiles would be marked in the field with signage indicating either "Solid Waste," "Hazardous Waste" or "Soils for Reuse."
Similar to the approach with PCB contaminated soils, at the onset of the cleanup areas with lead contamination of 400 ppm or greater would be located in the field using conventional surveying equipment. These soils would then be excavated and screened. Any soils with a contamination level above 400 ppm would be temporarily placed in the "Solid Waste" stockpile and then exported from the Site to an approved landfill. After the excavation of the soils is complete, the sidewalls and bottom of excavation would be sampled to ensure residual soils have contamination levels below 400 ppm.

It is anticipated that Remedial Action Alternative 4 would take approximately one month to complete.

Cleanup Objectives:

1. *Overall Protection of Public Health and the Environment*
2. *Compliance with Standards, Criteria and Guidance (SCG)*
3. *Long-Term Effectiveness and Permanence*
4. *Reduction of Toxicity, Mobility, or Volume with Treatment*
5. *Short-Term Effectiveness*
6. *Implementability*
7. *Cost*
8. *Community Acceptance*
9. *Land Use*

## 7.0 DETAILED EVALUATION OF ALTERNATIVES

### 1) *AOC 1 and AOC-2: Impacted Soils Left In-Place* - No Action

Under this alternative the soils in AOC 1 and AOC-2 would remain as is and future Site use and development would not be limited. In addition, remedial and monitoring activities as well as placement of institutional controls at the Site would not be implemented.

*Assessment*

This alternative would not result in the protection of human health or the environment since contaminated soil and fill material would be left in place. Soil samples collected from the Site were found to exceed NYSDEC Part 375 SCOs and, in the event that the impacted area is disturbed during future Site activity and no remedial actions have been undertaken, there is a potential for human exposure to the impacts.

With the exception of possible natural attenuation of SVOCs, this alternative would not result in the reduction of contaminant toxicity, mobility, or volume and would not be in compliance with chemical-specific remedial action objectives. Therefore, this alternative is not protective of the environment.

There would be no increased short-term risks associated with the no action alternative for the area since remedial activities would not be implemented and there does not appear to be a current exposure pathway with these impacts; however, this alternative is not be effective in the long-term and is not a permanent remedy.

Based on the findings of the studies performed to date it is anticipated that this alternative would not be acceptable to the community.

Of the alternatives being considered, the no action alternative for this AOC is not effective for the long-term, does not reduce toxicity, mobility, or contamination at the Site. . The estimated cost for this alternative is summarized below:

Estimated Cost of No Action**................................................................$ 0**

***2)* Soil capping, partial soil excavation and disposal offsite and Site Management Plan with Institutional Controls:**

Under this scenario, a composite cover system consisting of soil cover on disturbed areas, asphalt or concrete pavement on walkways, roads and parking lots, and concrete building slabs would prevent exposure to contaminated soils. The soil cover layer would be two feet thick and would consist of clean soil that meets 6 NYCRR Part 375-6 Track 2 Restricted Residential SCOs. The soil cover would overlay a layer demarcating the top of residual contaminated soil. The top six inches of the soil cover would be of sufficient quality to support vegetation. Slabs and paving systems (buildings, roadways, parking lots, etc.) would be at least six inches thick. Sampling procedures would be utilized to identify soils containing PCB contaminant levels greater than 10 ppm and lead levels of greater than 400 ppm. The excess soils from the cut and fill operations required for the development of the project, as well as all soils with PCBs of at least 10 ppm or lead of at least 400 ppm would be transported for disposal to a local landfill.

All procedures and requirements set forth in section 6.0 of this plan would be followed.

*Assessment*

This alternative will be protective of human health or the environment. Once implemented, there will be no potential for human exposure to the impacted soils.

This alternative will be in compliance with chemical-specific RAOs.

During implementation of this approach, there would be potential for exposure of workers to contaminated soil and fill material; however, this potential would be controlled through proper implementation of the SMP and HASP.

Because this alternative will be effective in the long-term as a permanent remedy by removal of all contaminated soil and fill from the Site, this alternative would result in permanence and long-term effectiveness.

It is anticipated that this alternative will be acceptable to the community. However, the truck traffic and possible resulting dust could result in negative impacts on the community.

This alternative requires that approximately 21,50,000 cubic yards of soil from the AOCs be exported from the Site and deposited in a local landfill. Approximately 5,185 cy of material would be imported from the Borrow Pit into the BCP Site to be used for the two foot cap.

Under this restricted residential use alternative, institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a SMP, including a HASP, will be implemented to minimize potential exposures and also control Site use. The SMP would include procedures for properly handling and disposing of impacted soils should they be disturbed in the future.

As the proposed Site development includes the construction of apartment buildings with asphalt driveways and parking lots, these costs will be incurred regardless of BCP remedial measures. The estimated cost for this alternative is based on the estimated time, labor, and equipment to move contaminated soils within the BCP Site boundaries, place two feet of clean fill soils collected from clean soils outside of the BCP Site boundary, monitor these activities in conformance with the Community Air Monitoring Plan (CAMP), and prepare the SMP/HASP. Costs also include exporting the excess soils from the Site to a local landfill.

**Total Cost ....................................................................... $1,145,275**

**3) Total Excavation of soils from AOCs for Off-Site Disposal:**

Under this alternative, all soils in AOC-1 and AOC-2 will be excavated for off-site disposal at a permitted landfill as a non-hazardous waste.

*Assessment*

This alternative will be protective of human health and the environment because, once implemented, all contaminated soil and fill material will be removed and there will be no potential for human exposure to the impacted soils and no impact to the environment.

Because all contaminated soil and fill material will be removed, this alternative will result in compliance with chemical-specific RAOs.

During implementation of this approach, there would be potential for exposure of workers to contaminated soil and fill material; however, this potential would be controlled through proper implementation of the SMP and HASP. Because the remedy would result in the removal of all contaminated soil and fill from the Site, this alternative would result in permanence and long-term effectiveness.

It is anticipated that this alternative would be acceptable to the community since it would result in the removal of all contaminants from the Site. However, the truck traffic and possible resulting dust would result in negative impacts on the community.

Of the alternatives being considered, excavation and off-site disposal of contaminated soil and fill will be effective for the long-term and mitigates future concerns relative potential future exposures to impacted soils in these areas.

Based on the RI data, and using the assumption that the fill soils do not contain PCBs at concentrations greater than 50 milligrams per kilogram, a remediation approach of excavation and off-site disposal has been analyzed for AOC-1 and AOC-2. Based on the assumption that approximately 110,000 cubic yards of contaminated soil and fill are present in AOC-1 and AOC-2, and using a conversion factor of 1.6 tons per cy of soil, approximately 176,000 tons of soils would require excavation for off-site disposal. Excavation, transportation, and landfill tipping fees costs are estimated at $75.00 per ton.

The attached cost estimate provides a detailed analysis of the anticipated costs associated with this Remedial Action Alternative.

**Total Cost ........................................................................................ $4,131,000**

**4) Impacted soils excavated for onsite management and Site Management Plan with Institutional Controls:**

Under this scenario, portions of the soils in AOC-1 and AOC-2 would be excavated and removed to allow for the construction of new building foundations, roadways and utilities. Sampling procedures would be utilized to identify soils containing PCB contaminant levels greater than 10 ppm and lead levels of greater than 400 ppm. Soils exceeding these thresholds will be temporarily stockpiled prior to exportation to an approved landfill.

The excess soil not transported off-site would be placed in a separate stockpile. After the Borrow Pit area was excavated, these soils would then be placed in the Borrow Pit. The

Borrow Pit will be covered with orange construction fencing to demarcate the interface of two feet of clean soils over the impacted soil and fill. After all of the contaminated soils were placed in the Borrow Pit, it would then be capped with two feet of clean soils.

Prior to placement of the contaminated soils in the Borrow Pit, it will be cleared of vegetation. After the vegetation is cleared, the Borrow Pit would be excavated and the soils stockpiled for later use in the redevelopment project and for the two-foot cap on the BCP Site.

All disturbed areas within the AOCs would be covered with a composite cover system consisting of soil cover on open areas, asphalt or concrete pavement on walkways, roads, and parking lots, and concrete building slabs in the same manner outlined in Section 2.

All procedures and requirements set forth in section 6.0 of this plan would be followed.

*Assessment*

This alternative will be protective of human health or the environment because, once implemented; there will be no potential for human exposure to the impacted soils.

This alternative would result in compliance with chemical-specific RAOs.

During implementation of this approach, there would be potential for exposure of workers to contaminated soil and fill material; however, this potential would be controlled through proper implementation of the SMP and HASP.  Because the remedy would result in the removal or containment of all contaminated soil and fill from the Site, this alternative would result in permanence and long-term effectiveness.

It is anticipated that this alternative will be acceptable to the community.

Of the alternatives being considered, the Borrow Pit and composite cover system alternative for these AOCs will be effective for the long-term, and mitigates concerns relative to potential future exposures to impacted soils. It also allows the excess excavation from the AOCs to be buried within the BCP Site without any additional environmental concerns including impacts to the local landfill and impacts associated with trucking.

The Borrow Pit area is immediately adjacent and contiguous to the AOCs and is located within the BCP Site.

Under this restricted residential use alternative, institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a SMP, including a HASP, will be implemented to minimize potential exposures and also control Site use, inclusive of AOC 1 and AOC-2 and the Borrow Pit area. The SMP would include procedures for properly handling and disposing of impacted media soils should they be disturbed in the future.

This alternative would be protective of human health and the environment. The SMP will provide the necessary controls to minimize potential future exposures and the institutional controls would provide the necessary mechanism to ensure proper notification to future owners.

As the proposed Site development as indicated on Drawing 2 includes the construction of apartment buildings and asphalt driveways and parking lots, these costs will be incurred regardless of BCP-required remedial measures. The estimated cost for this alternative is based on the estimated time, labor, and equipment to move contaminated soils within the BCP Site boundaries, place two feet of clean fill soils collected from the Borrow Pit area, monitor these activities in conformance with the CAMP, and prepare the SMP/HASP. A detailed cost estimate for Remedial Action Alternative 4 is provided at the appendix of this plan.

**Total Cost** **$332,240**

## 8.0 COMPARATIVE EVALUATION OF ALTERNATIVES AND RECOMMENDED ACTIONS

This section of the RAWP compares the remedial alternatives proposed and presents the recommended action for addressing contamination at the Site.

Alternative 1: The no action alternative will not be protective of human health and the environment. While the no action alternative may be acceptable to the community, any future intrusive activities in AOC 1 and AOC-2 will result in exposure to impacted soil and fill material at the Site, which presents a potential exposure pathway for workers in the area. Further, the no-action alternative does not result in the mitigation of contaminants in the environment.

Alternative 2: The composite cover system consisting of soil cover on open areas, asphalt or concrete pavement on walkways, roads and parking lots, and concrete building slabs would be protective of human health and the environment. It can be implemented during the proposed Site development and will mitigate future concerns relative to exposure through direct contact.

However, the removal of contaminated soil and fill material for offsite disposal are cost-prohibitive which would impact the ability to favorably develop the Site and undertake the remediation.

Alternative 3: The excavation and removal of all contaminated soils for off-site disposal alternative in AOC 1 and AOC-2 would be a long-term and permanent remedy; however, the estimated costs do not appear to justify the benefits of soil removal. Also, the costs would prevent the development of the parcel. As such, this remedial alternative is not considered practicable.

Alternative 4: The removal and off-site landfilling of soils with at least 10 ppm PCBs or 400 ppm lead, partial excavation of other soils from the AOCs at the Site and placement on the same parcel in a Borrow Pit (with any excess material landfilled off-site), and installation of a capping system alternative would provide a mechanism to effectively manage Site contaminants without bearing the cost of exporting the material from the Site. Similar to

Alternative 2, all disturbed areas within the AOCs would receive a composite cover system consisting of soil cover on open areas, asphalt or concrete pavement on walkways, roads and parking lots, and concrete building slabs.

The recommended remedial action for AOC 1 and AOC-2 is Alternative 4, using a composite cover system combined with the management of excess soils on the BCP Site in the surveyed and demarcated Borrow Pit area. This alternative also includes the preparation of the SMP with institutional controls, and removal and off-site landfilling of the most contaminated soils.

## 9.0 REMEDIAL ACTION WORK PLAN

This section presents the RAWP for the recommended actions for the Site. The development of this RAWP is in accordance with the NYSDEC BCP Guide dated May 2004, and NYSDEC Program Policy DER-10, Technical Guidance for Site Investigation and Remediation, dated May 2010. The following sub-sections present the methods for implementation of the RAWP. Both a Health and Safety Plan (HASP) (Appendix 4) and a Quality Assurance Project Plan (QAPP) (Appendix 3) have been prepared for the project and will be implemented during construction. Continuous air monitoring for particulates will be provided in accordance with Section 9.5 and the Community Air Monitoring Plan (CAMP) (Appendix 2).

### 9.1 Remedial Strategy

Excavations in the BCP Site required for the development of the apartment project range in depth from one foot to twelve feet. The deepest excavations are required for the construction of the garage and foundation system for proposed apartment buildings #7 and #8. The basement slab of these two buildings will be approximately ten feet below existing grade. Therefore, extensive excavation of contaminated soils within the BCP Site is required in order to bring the Site to subgrade. Additional excavations of contaminated soils will be required for the excavation associated with the installation of utilities including watermains, sanitary sewers and storm sewers. Trench excavations will range from 12”-36” in width and 4 to 12 feet in depth.

Prior to mass excavation in the BCP Site, soils containing PCBs of at least 10 ppm or lead of at least 400 ppm, and any material classified as solid waste (not considered exempt construction and demolition debris per Part 360-7) will be identified, removed and temporarily stockpiled for disposal as identified in this plan. After removal of this contaminated soil and any solid waste, the BCP Site will be excavated to achieve design subgrade elevations required for the construction of the apartment buildings and associated infrastructure. The remaining contaminated soils will be placed in a separate stockpile for future placement in the BCP Site or the Borrow Pit area. The contaminated soils will be preferentially moved back into the BCP Site to achieve final subgrades in order to reduce the volume of contaminated soils moved off-site to a 6NYCRR Part 360 permitted landfill.

All transporters of contaminated soils from the Site will be properly permitted/registered to transport solid or hazardous waste. Bills of lading/disposal receipts will be included in the Final Engineering Report.

Once design grade in the BCP Site has been achieved, a two-foot cap or surface cover system will be installed on the BCP Site, including the Borrow Pit.

The purpose of the surface cover system is to eliminate the potential for human contact with fill material and eliminate the potential for contaminated runoff from the property. The cover system will consist of one or more of the following:

- Soil: Twenty-four (24) inches of vegetated soil cover underlain by an orange plastic snow fence as a demarcation layer in outdoor vegetated areas.

- Asphalt: a minimum of twelve (12) inches of material (asphalt and sub-base material) in areas that will be developed as roadways, sidewalks, and parking lots underlain by an orange plastic snow fence as a demarcation layer.

- Concrete: a minimum of six (6) inches of material (concrete and sub-base material) in areas that will become slab-on-grade structures for buildings, roads, sidewalks, and parking lots in lieu of asphalt, underlain by an orange plastic snow fence as a demarcation layer. The snow fence is not proposed beneath the building slabs.

## 9.2 Summary of Recommended Final Remedial Actions

Step #1 – Soil Removal

The first step of the remedial project will be to remove all of the soils with PCB levels of at least 10 ppm and lead levels of at least 400 ppm for off-site disposal. Soils will be excavated from these areas and staged on polyethylene sheeting. Upon completion the soils will be sampled for landfill characterization purposes and then covered with polyethylene sheeting. A survey crew will locate and stake the locations previously identified with elevated PCB and lead levels at the onset of the remedial project:

### *1) Lead*

There are three locations where elevated levels of lead will be addressed. Borehole locations GP-2 in the interval from 0 to 4 feet beneath ground surface (BGS), BH-3 (4 to 6 ft. BGS) and GP-10 (4 to 8 ft. BGS) indicated lead levels of 2140 ppm, 3450 ppm, and 1060 ppm, respectively. These locations will be staked by a survey crew and handled as follows:

GP-2:

GP-2 is just west of the BCP boundary on the western periphery of the historic fill area. The Geoprobe log for GP-2 indicates that native silty soils were encountered at an approximate depth of 4 ft. BGS. The elevated lead level was detected in the fill soils overlying the silt. Approximately five (5) feet will be measured from the stake indicating the GP-2 location in the geographical north, south, east, and west directions, all of the soils within this area will be excavated down to native soils. The excavated soils will be staged on polyethylene. Upon completion, documentation samples will be collected from the pit walls and pit bottom for lead analysis. The soil samples will be submitted to Paradigm Environmental Services, Inc. (Paradigm) for lead analysis by USEPA Method 6010 with a one-day turnaround time with a NYSDEC Analytical Services Protocol (ASP) Category A deliverable. If these data indicate that lead levels < 400 ppm have been achieved throughout, the excavation will be deemed to be complete. If residual lead levels are detected at levels > 400 ppm in any of the samples, additional excavation of soils in that vicinity and documentation sampling will again be performed. The excavation will continue until the documentation samples demonstrate compliance with the 400 ppm SCO for lead, in which case ASP Category B deliverables will be obtained. This last set of samples will be classified as the "confirmatory samples."

BH-3:

BH-3 is approximately 125 feet north of GP-2. The soil boring log indicated approximately 35 feet of fill materials above the native soils in this location. The elevated lead level was detected in the range of 4 to 6 ft. BGS. Approximately five (5) feet will be measured from the stake indicating the BH-3 location in the geographical north, south, east, and west directions, and all soils will be excavated within this area down to approximately ten (10) feet BGS. The soils will be handled and sampled as described above. The excavation will continue until the documentation samples demonstrate compliance with the 400 ppm SCO for lead, in which case ASP Category B deliverables will be obtained. At that point, the last set of samples will be classified as the confirmatory samples.

GP-10

GP-10 is approximately 150 feet north of BH-3. The soil boring log indicated approximately 35 feet of fill materials above the native soils in this location. The elevated lead level was detected in the range of 4 to 8 ft. BGS. The Geoprobe hit refusal and was not capable of sampling deeper than 8 ft. BGS. Approximately five (5) feet will be measured from the stake indicating the GP-10 location in the geographical north, south, east, and west directions, and all soils will be excavated within this area down to approximately ten (10) feet BGS. The soils will be handled and sampled as described above. The excavation will continue until the documentation samples demonstrate compliance with the 400 ppm SCO for lead. At that point, the last set of samples will be classified as the confirmatory samples.

### *2) PCBs*

There are two areas where elevated levels of PCBs (Aroclor 1254) will be addressed. Area 1 is in the northwest corner of the Site where TP-5A in November 2002 and TP-7 in January 2010 identified 83.9 ppm and 13.0 ppm of Aroclor 1254, respectively. The second area is in the southwest corner of the Site where TP-2A in November 2002 and GP-7 in December 2010 identified 28.0 ppm and 18.1 ppm of Aroclor 1254, respectively.

Area 1 is near the periphery of the historic fill area; the test pit log for TP-7 indicated clean-appearing native soils at an approximate depth of 5 feet BGS. Approximately five (5) feet will be measured out from the line connecting the TP-5A and TP-7 stakes in the geographical north, south, east, and west directions, and all soils will be excavated within this area down to native soils. The excavated soils will be staged on polyethylene. Upon completion, confirmatory samples will be collected from the pit walls and pit bottom and submitted to Paradigm for PCB analysis by USEPA Method 8082 with a one-day turnaround time with a NYSDEC Analytical Services Protocol (ASP) Category A deliverable. Soil documentation samples will be collected from around the perimeter of the pit, and from the pit bottom, at intervals of approximately 10 feet for PCB analysis. If these data indicate that PCB levels < 10 ppm have been achieved throughout, the excavation will be deemed to be complete. If residual PCBs are detected at levels > 10 ppm in any of the samples, additional excavation of soils and documentation sampling will again be performed. The excavation will continue until the documentation samples demonstrate compliance with the 10 ppm SCO for PCBs. The last set of samples will be classified as the "confirmatory samples" if they are tested by ASP Method 8082, and ASP Category B deliverables are obtained.

Area 2 is in the southwest corner of the Site. Approximately five (5) feet will be measured out from the stakes indicating the locations of TP-2A (2002) and GP-7 (2009) in the geographical north, south, east, and west directions from these locations, and all of the soils will be excavated within these areas down to native soils or an approximate depth of 15 feet BGS, whichever is first encountered. Confirmatory sampling will be performed in a similar fashion to Area 1, and the excavation will continue until the documentation samples demonstrate compliance with the 10 ppm SCO for PCBs. The last set of samples will be classified as the confirmatory samples if they are tested by ASP Method 8082 and ASP Category B deliverables are obtained.

Step #2 – Staged Soils

The staged soils will be treated as solid waste and placed in stockpiles on the BCP Site with signage labeled “Solid Waste.” The soils will be staged on, and covered with polyethylene sheeting. Upon completion they will be sampled for landfill characterization in conformance with Waste Management of New York, LLC (WM) requirements. One sample will be collected from the first 500 tons of staged soil, and one additional sample will be collected from each 1000 ton aliquot after the initial samples. WM requires that the soils be analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), PCBs, and Toxicity Characteristic Leaching Procedure (TCLP) Metals. Based on these results the soils will either be transported for disposal as solid waste at the WM High Acres or Mill Seat Landfill, or as hazardous waste at their Model City Landfill.

If any of the soils are identified as having PCB contamination of 50 ppm or greater, these materials will be placed in a separate stockpile on the BCP Site and managed as hazardous waste. This stockpile will be marked in the field with signage as “Hazardous Waste.” The characterization sampling will determine if these soils are disposed of as solid waste or hazardous waste.

Step #3 – Confirmatory Samples

After the excavations are confirmed to be complete and in conformance with the 10 ppm SCO for PCBs and 400 ppm SCO for lead, confirmatory sampling will be conducted in each excavation. The number of soils collected for analysis will be in conformance with Section 5.4(b) of DER-10.

The confirmatory samples where soils with elevated lead levels have been removed will be analyzed for lead by ASP Method 6010B with Category B deliverables with third party validation.

The confirmatory samples where soils with elevated PCB levels have been removed will be analyzed for PCBs by ASP Method 8082 with Category B deliverables with third party validation.

Step #4 – Soil Removal

Based on WM's review of the laboratory characterization of the staged soils, the soils will be transported for off-site disposal in a landfill or previously approved site. All trucks leaving the BCP Site will pass through a truck wash down decontamination area.

Loaded vehicles leaving the Site will be appropriately covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

Step #5 – Vehicle Decontamination

A decontamination (decon) pad will be constructed to decontaminate equipment and vehicles exiting the Site, such as excavators, or support trucks that may have come into contact with contaminated soil. At a minimum, equipment and/or vehicles that contact potentially contaminated soil will be washed down (or dry decontaminated) prior to exiting the Site.

The decon pad dimensions will be approximately 25 feet (length) by 15 feet (width) as shown at Drawing 5. The decontamination pad shall be constructed of two layers of 6-mil polyethylene sheeting with a sump for the purposes of collecting wash waters. Wash waters will be stored in 55-gallon drums and properly disposed of off-Site at the end of the project. Accumulated sediments are proposed to be disposed of with the impacted soils. A 12-inch-high containment berm constructed of clean sub-angular stone will be placed around the perimeter of the decon pad. A wash down area will be provided within the BCP Site.

The decontamination pad will be disposed of off-Site at the completion of the project. The Contractor will provide a minimum 250-gallon aboveground storage tank for the storage of potable water that will be used for decontamination activities. If necessary, the Contractor will obtain and keep current a hydrant use permit for the duration of the project.

Soil Stockpiling

The Contractor will construct and maintain staging areas comprised of a layer of 6-mil polyethylene sheeting for staging the excavated impacted soil. The Contractor will cover the staged materials during non-working hours with a layer of 6-mil polyethylene sheeting. The covers will be anchored or weighted at the edges to prevent stormwater and wind borne erosion.

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

Passero Associates will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development.

All transport of materials will be performed by permitted haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

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

Step #6 – Site Grading and Preparatory Work

After the staged soils have been removed, the remaining soils will be excavated and stockpiled in the BCP Site to bring the Site to "subgrade" for construction of the buildings, parking lots, utilities, and other infrastructure associated with the development of the apartment project. This step includes the excavation of soils within the AOCs to allow for the installation of utilities. Prior to placement of the two-foot cap, all utilities in the BCP Site will be installed. This stockpile will be identified by signage labeled "Soils for Re-Use Under Cap." However, if during excavation any material classified as solid waste (not considered exempt construction and demolition debris per Part 360-7) is identified, it will also be placed in the Solid Waste stockpile.

Step #7 – Erosion control measures will be installed in accordance with the details as outlined in Drawing 5 to protect stockpiles. This step will be performed at the time each stockpile is created (i.e. also at the time of Steps #1, #2 and #8).

Step #8 – The Borrow Pit area on the BCP Site will be cleared and excavated. The soils will be staged in an area identified by signage labeled "Clean Soils" for use in the two-foot cap. Soils from the Borrow Pit not used in the BCP Site will be transported to other portions of the development project for use in construction activities.

Step #9 – Soils will be moved from the stockpile of soils labeled "Soils for Re-Use Under Cap" into the Borrow Pit on the BCP Site to establish the final subgrade. Soils determined after testing to have a PCB contamination level of less than 1 ppm may be used in the BCP Site as the two foot cap in lawn areas. If there is not enough capacity in the Borrow Pit to bury these soils, they will be transported off-site to a landfill (or to be beneficially re-used if approved by NYSDEC) in accordance with Step #4.

Soil imported and exported to the BCP Site shall be sampled in accordance with DER-10 Section 5.4, specifically Table 5.4(e)10 with the following modifications: Sampling to be 10 discrete VOC samples and 10 composite samples for SVOC, PCBs, Metals, and Pesticides for each 5000 cubic yards. Sampling to be performed for each 5000 cubic yards and results evaluated prior to import or export.

Step #10 – Soils not required to be disposed of in an off-site landfill will be transported from temporary stockpile labeled "Soils for Re-Use" to Borrow Pit.

Step #11 – Once all potentially contaminated soils have been placed in Borrow Pit, a demarcation layer (orange snow fence) will be installed. After the demarcation layer is installed, a two foot layer of clean soils previously excavated from the Borrow Pit will be placed over the demarcation layer.

Step #12 - Once the subgrade is established and stockpiles have been exported or moved into the Borrow Pit, construction will begin for the apartment project and associated infrastructure. All areas in the BCP Site containing residual waste materials will wither be capped with concrete slabs and asphalt paving systems (buildings, roadways, parking lots, etc.) at least six inches thick, or else a demarcation layer (orange snow fence) and two feet of clean soil from the Borrow Pit. The top six inches of the soil cover will be of sufficient quality to support vegetation.

Institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a Site Management Plan (SMP) including a Soil Management Plan and a HASP will be implemented to protect against exposure and also control future Site use.

## 9.3 Cover Materials

A composite cover system consisting of clean soil cover on open areas; asphalt or concrete pavement on walkways, roads and parking lots; and concrete building slabs will prevent exposure to contaminated soils. The soil cover layer will be a minimum of two feet thick and will consist of clean soil that meets the 6 NYCRR Part 375-6.8 restricted use cleanup objectives for restricted residential use in order to comply with Track 4 SCOs. The soil cover will overly a demarcation layer indicating the top of residual contaminated soil. The top six inches of the soil cover will be of sufficient quality to support vegetation. Slabs and paving systems (buildings, roadways, parking lots, etc.) will be at least six inches thick.

## 9.4 Site Management Plan/Institutional Controls

A SMP coupled with Institutional Controls will be developed for the entire Site, inclusive of AOC 1 and AOC-2 and the Borrow Pit area. The intent of the SMP will be to manage and control any impacts remaining at the Site. The SMP will be developed and submitted for regulatory approval subsequent to completing the active remedial work identified for AOC 1 and AOC-2. The SMP will include the following:

- Identify specific areas of residual impacted soil that remain on Site and illustrate these areas on mapping.

- A Soils Management Plan that identifies proper handling, characterization, transportation, and disposal requirements for the various impacted material should such material be encountered during any Site redevelopment or future construction activities (e.g., underground utility work). This portion of the SMP will include (but not be limited to) handling of the impacts left in-place along the eastern property boundary of the Site.

- Indicate that groundwater cannot be used as a source of drinking water or extracted for any reason without prior approval from regulatory agencies.

- Indicate that an annual certification be submitted to NYSDEC certifying that the requirements of the SMP were adhered to.

- Indicate that the above Site use and groundwater use restrictions are part of an environmental easement and will include a copy of the easement.

## 9.5 Community Air Monitoring Plan (CAMP)

This RAWP will be conducted in conformance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) (Appendix 2). The CAMP will be implemented during all soil disturbance activities as detailed in this plan and as provided at Appendix 2.

### 9.5.1 VOC Monitoring

Despite the fact that VOCs are not considered contaminants of concern at the Site, air monitoring for VOCs will be conducted during all excavation activities conducted in AOC-1 and AOC-2. Upwind concentrations will be measured to establish background concentrations. VOCs will be continuously monitored at the downwind perimeter and at several locations along the perimeter of the Site where vapors would be expected to leave the Site. Air Monitoring will focus on downwind areas, and will be adjusted as wind directions vary.

The following actions will be taken based on organic vapor levels measured:

- If total organic vapor levels exceed 5 parts per million (ppm) above background at the perimeter, work activities will be temporarily halted and monitoring continued. If levels decrease below 5 ppm above background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the hot zone or half the distance to the nearest potential receptor or residential/commercial structure, is below 5 ppm.

- If the total organic vapor level is above 25 ppm at the perimeter, Site activities will be shutdown.

- All readings will be recorded and available for NYSDEC and NYSDOH personnel to review.

### 9.5.2 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the excavation, activities will be halted, and monitoring continued. Biosolve will be applied to the excavation areas using a pressure washer. If the organic vapor level decreases below 5 ppm above background, excavation activities can resume provided:

- The organic vapor level 200 feet downwind or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

- If the organic vapor level is greater than 25 ppm above background in the breathing zone, work activities will be shut down. When work shut-down occurs, down-wind air monitoring as will be conducted to ensure that vapor emissions do not impact the nearest residential or commercial structure.

### 9.5.3 Major Vapor Emission

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

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

If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes, or

- Organic vapor levels greater than 5 ppm above background for any time period.

### 9.5.4 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. The local police authorities will be contacted and advised of the situation;

2. Air monitoring will be conducted at 30-minute intervals within the 20 Foot Zone. If two successive reading below action level are measure, air monitoring may be halted or modified; and

3. All Emergency contacts will go into effect as appropriate.

#### 9.5.5 Dust Control

In the event that dust exceeds CAMP guidelines, dust control measures will be implemented. A temporary supply water line will be installed from the municipal water supply on-site or dewatering trucks will be on site. Hoses will be connected and water sprayed on the various areas as needed. Water will be applied to minimize dust and not create any unnecessary run-off from the Site.

### 9.6 Final Engineering Report

The results of this RAWP including periodic testing and sampling, Site progress photos and an accounting of soils removed from the BCP Site will be detailed in a Final Engineering Report.

## 10.0 CONCLUSION

This RAA and RAWP provides a summary of remedial alternatives evaluated and selects remedial actions to be implemented for the BCP Site at 1440 Empire Boulevard in the Town of Penfield, New York. The selected remedy would allow for Site development as a residential apartment complex. Our recommended remedial approach calls for removal of soil contaminated with 10 ppm or more PCBs or 400 ppm or more lead, and all other contaminated soil and fill material in AOC-1 and AOC2 and (once transferred to the Borrow Pit) to be capped with either asphalt, a concrete building slab, or a minimum of two feet of clean soil cover. Institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) A SMP including a HASP will be implemented to protect against exposure and also control future Site use.

# DRAWINGS

# DRAWING 1 - Location Map

# LOCATION MAP

1440 Empire Blvd.
Town of Penfield, New York

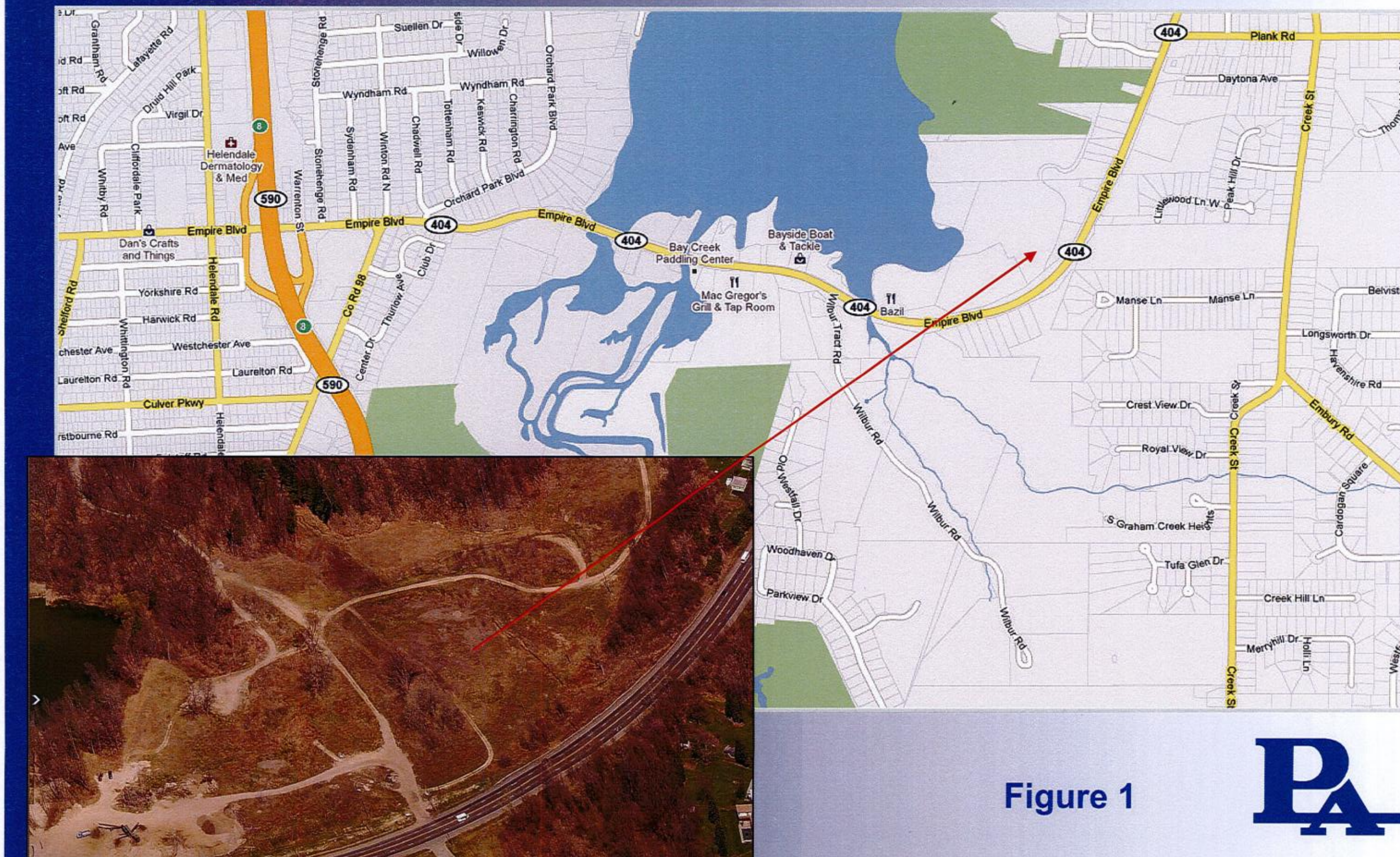


**Figure 1**

# DRAWING 2 - Areas of Concern and Sampling Locations


Passero Associates

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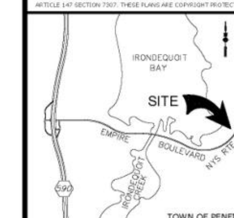
Revisions

| No. | Date | By | Description |
|---|---|---|---|
| 1 | | | |




LOCATION SKETCH

**Passero Associates**

100 Liberty Pole Way, Rochester, NY 14604

(585) 325-1000 Fax: (585) 325-1691

| | |
|---|---|
| Principal-in-Charge | John F. Caruso, P.E. |
| Project Manager | Jess D. Sudol, P.E. |
| Designed by | Carole G. Harvey |

1440 EMPIRE PARTNERSHIP
1170 PITTSFORD VICTOR RD
PITTSFORD, NY 14534

## ENVIRONMENTAL TESTING LOCATIONS

1440 EMPIRE BOULEVARD

Town of Penfield, Monroe County, New York

Project No. 20121461.0001

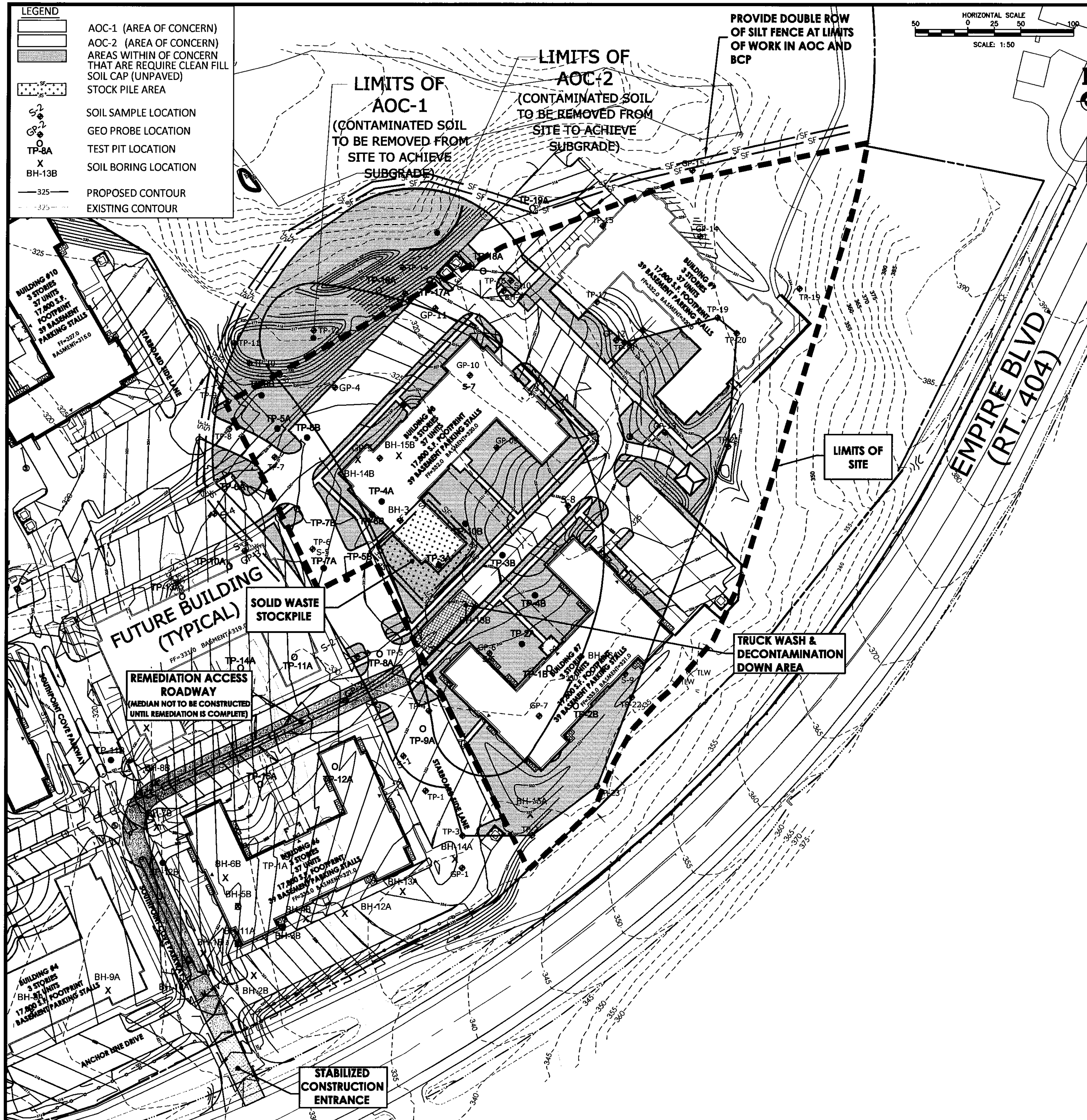
Drawing No. FIG. 2

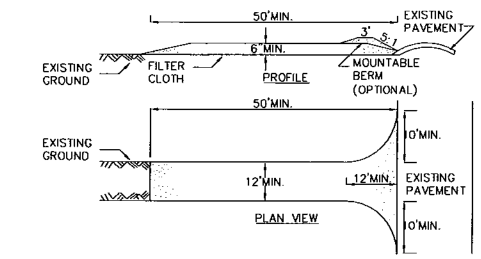
Sheet No. 2 OF 3

Scale: 1"=50'

Date February 2012

# DRAWING 3 – Remedial Alternative #2



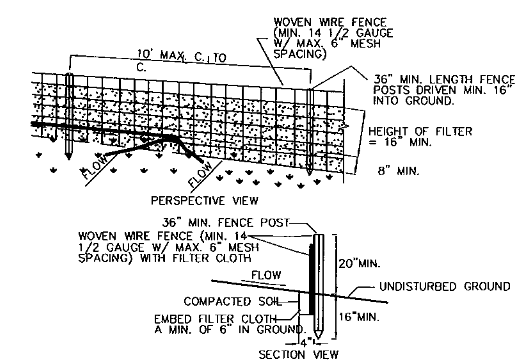




CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN

**STABILIZED CONSTRUCTION ENTRANCE**

N.T.S.




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, 12 1/2 GAUGE, 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.

**SILT FENCE DETAIL**

N.T.S.

**EARTHWORK SUMMARY**

1. MATERIAL TO BE EXCAVATED FROM BCP & EXPORTED OFFSITE= 24,000 CYDS
2. MATERIAL TO BE IMPORTED ONTO BCP FOR 2FT CAP = 5,185 CYDS

**ALTERNATIVE 2 - REMEDIAL ACTION WORK PLAN PROCEDURE**

1. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE, TRUCK WASHDOWN AREA AND REMEDIATION ACCESS ROADWAY.
2. CONSTRUCT SILT FENCE FOR CONTAMINATED SOIL STOCKPILE
3. EXCAVATE ALL SOILS IN CONTAMINATED AREA TO A DEPTH OF TWO FEET BELOW PROPOSED EXPOSED SOILS, ONE FOOT BELOW PAVEMENT, AND TO THE REQUIRED DEPTH BELOW BUILDING FOUNDATIONS ALL EXCAVATIONS TO BE DONE TO PROPOSED GRADE.
4. EXPORT AND REMOVE CONTAMINATED SOILS FROM SITE
5. USE CLEAN SOIL TO FILL TO PROPOSED GRADE AND PROVIDE 2' CAP

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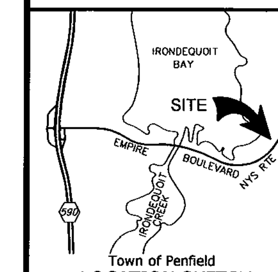



LOCATION SKETCH

N.T.S.

Client:
**Southpoint Cove LLC**
**1170 Pittsford-Victor Road**
P.O.Box 1660
Pittsford, NY 14534
Robert Morgan (585)419-9630

**Passero Associates**
100 Liberty Pole Way
Rochester, New York 14604
(585) 325-1000
Fax: (585) 325-1691

Principal-in-Charge John F. Caruso, P.E.
Project Manager Jess D. Sudol, P.E.
Designed by Carole G. Harvey

Revisions

| No. | Date | By | Description |
|---|---|---|---|
| 1 | | | |



REMEDIAL ACTION WORK PLAN ALTERNATIVE 2

SOUTHPOINT COVE APARTMENTS

Town/City: Penfield
County: Monroe State: New York

Project No. 20121461.01

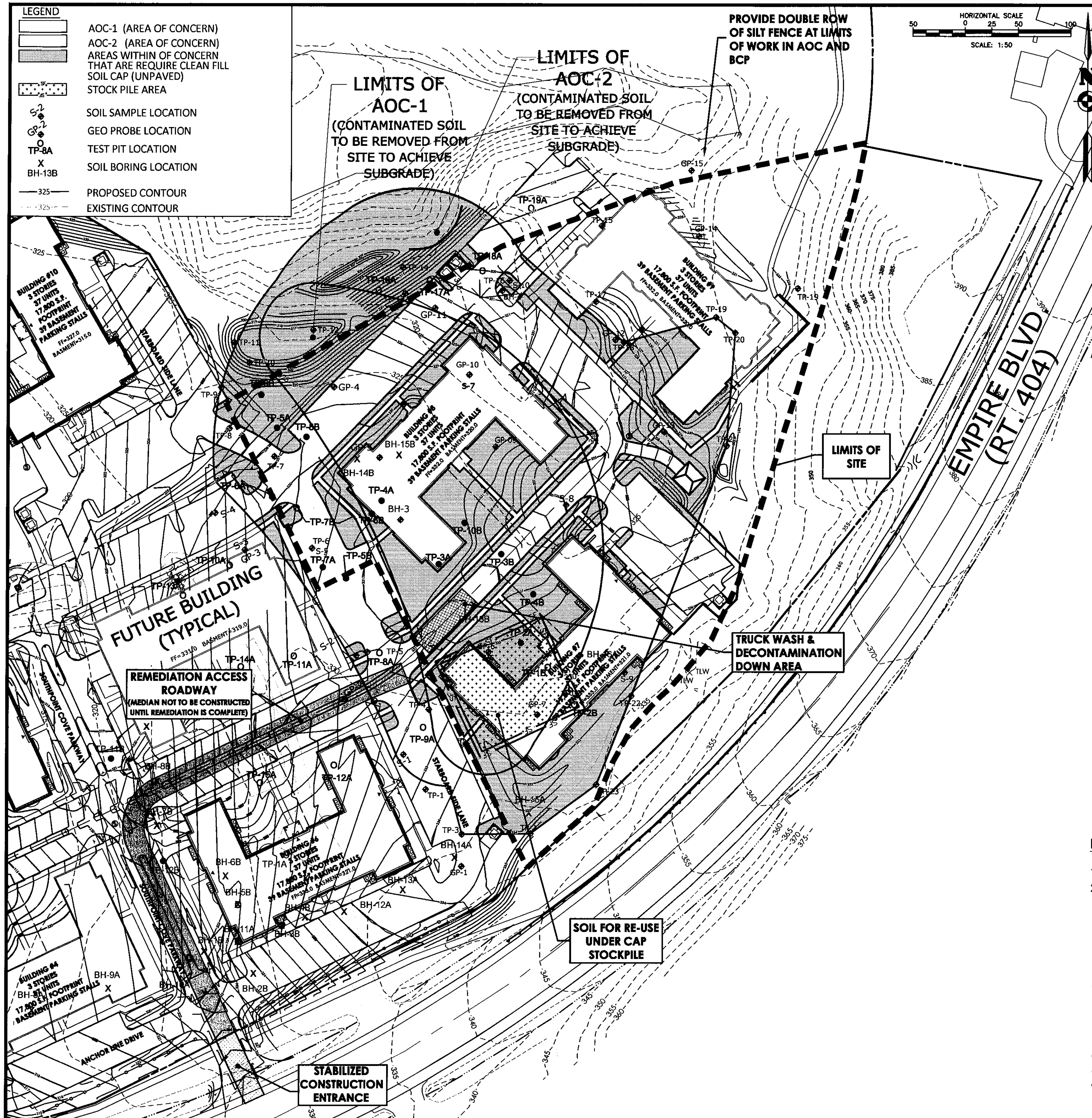
Drawing No.

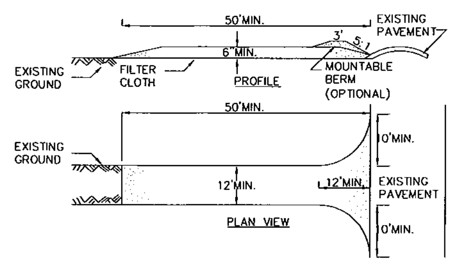
Sheet No. 1 of 3

Scale: 1"=50'

Date **AUGUST, 2012**

# DRAWING 4 – Remedial Alternative #3



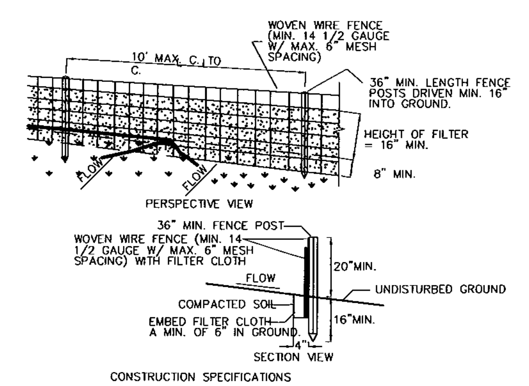




CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN

## STABILIZED COSNTRUCTION ENTRANCE

N.T.S.




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, 12 1/2 GAUGE, 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.

## SILT FENCE DETAIL

N.T.S.

## EARTHWORK SUMMARY

1. MATERIAL TO BE EXCAVATED FROM BCP & EXPORTED OFFSITE= 70,000 CYDS
2. MATERIAL TO BE IMPORTED FROM OFFSITE = 40,000 CYDS

## ALTERNATIVE 3 - REMEDIAL ACTION WORK PLAN PROCEDURE

1. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE, TRUCK WASHDOWN AREA AND REMEDIATION ACCESS ROADWAY.
2. CONSTRUCT SILT FENCE ISOLATING AND DEFINING CONTAMINATED SOILS STOCKPILE EXCAVATE ALL SOILS IN CONTAMINATED AREA TO THEIR FULL DEPTH (25 FEET AVE. FOR AOC-1 , 8 FEET AVE. FOR AOC-2)
3. SEPARATE AND STOCKPILE HAZARDOUS SOIL IN THE DESIGNATED AREA AND CONTAMINATED SOIL IN THE DESIGNATED AREA.
4. BRING IN CLEAN SOIL TO SITE
5. EXPORT AND REMOVE CONTAMINATED SOILS FROM THE SITE
6. USE CLEAN SOIL TO FILL TO PROPOSED GRADE

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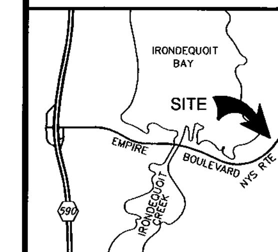


Town of Penfield
LOCATION SKETCH
N.T.S.

Client:
**Southpoint Cove LLC**
**1170 Pittsford-Victor Road**
P.O.Box 1660
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Fax: (585) 325-1691
Principal-in-Charge John F. Caruso, P.E.
Project Manager Jess D. Sudol, P.E.
Designed by Carole G. Harvey

Revisions

| No. | Date | By | Description |
|---|---|---|---|
| 1 | | | |



REMEDIAL ACTION WORK PLAN ALTERNATIVE 3

SOUTHPOINT COVE APARTMENTS

Town/City: Penfield
County: Monroe State: New York

Project No. 20121461.01

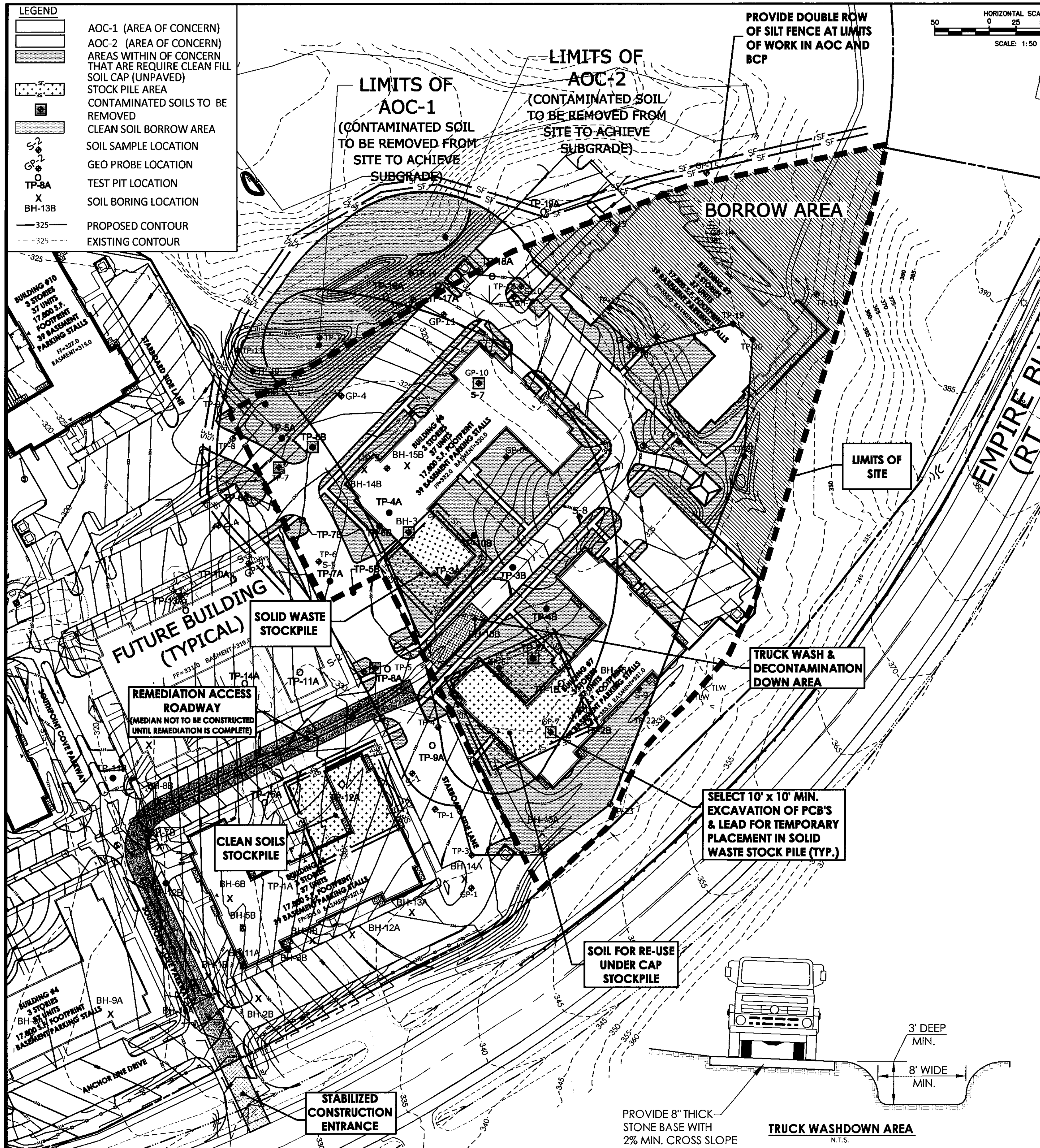
Drawing No.

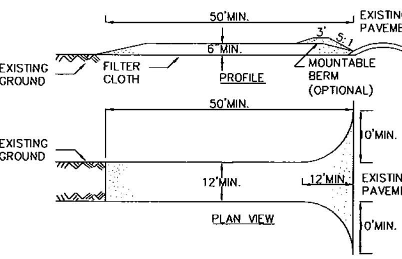
Sheet No. 2 of 3

Scale: 1"=50'

Date AUGUST, 2012

# DRAWING 5 – Remedial Alternative #4




CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
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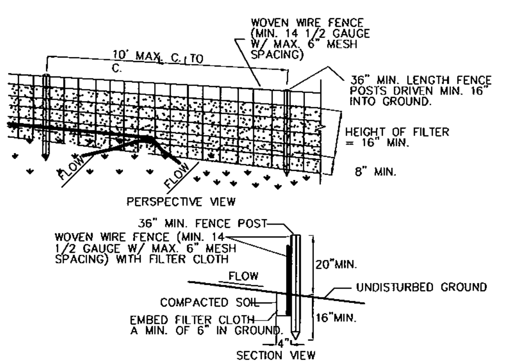
4. WIDTH – TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN

**STABILIZED COSNTRUCTION ENTRANCE**

N.T.S.




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.
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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.

**SILT FENCE DETAIL**

N.T.S.

**EARTHWORK SUMMARY**

1. MATERIAL TO BE EXCAVATED FROM BCP & PLACED IN BORROW AREA = 20,000 CYDS
2. SOLID WASTE MATERIAL (PCB & LEAD) TO BE EXPORTED OFF SITE= 1,500 CYDS
3. MATERIAL TO BE REMOVED FROM BORROW AREA FOR 2' CAP = 5,185 CYDS
4. MATERIAL FROM BORROW AREA TO BE USED IN OTHER PLACES OF SITE= 15,000 CYDS

**ALTERNATIVE 4 - REMEDIAL ACTION WORK PLAN PROCEDURE**

1. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE, TRUCK WASHDOWN AREA AND REMEDIATION ACCESS ROADWAY.
2. CONSTRUCT SILT FENCE ISOLATING AND DEFINING CONTAMINATED SOILS, HAZARDOUS SOILS AND CLEAN FILL.
3. IDENTIFY AND SELECTIVELY REMOVE PCB AND LEAD CONTAMINATED SOILS IN ACCORDANCE WITH RAWP. STOCKPILE IN "SOLID WASTE" PILE
4. EXCAVATE ENOUGH CLEAN SOIL FILL FROM BORROW AREA TO REPLACE SOIL EXCAVATED FROM CONTAMINATED AREA AS WELL AS ENOUGH TO PROVIDE A TWO FOOT CAP AFTER CONTAMINATED SOIL IS BURIED IN THE BORROW AREA. SOILS TO BE USED ON SITE OUTSIDE OF THE BCP SHALL BE SAMPLED IN ACCORDANCE WITH DER-10 AS EXPORTED SOILS.
5. EXCAVATE REMAINING SOILS IN CONTAMINATED AREA TO A DEPTH OF TWO FEET BELOW FINISH GRADE IN LAWN AREAS , ONE FOOT BELOW PAVEMENT, AND TO THE REQUIRED DEPTH BELOW BUILDING FOUNDATIONS.
6. PLACE CONTAMINATED SOIL INTO BORROW AREA. CAP WITH TWO FEET OF UNCONTAMINATED SOUL.
7. REMOVE SOLID WASTE TO EXTERNAL LANDFILL.

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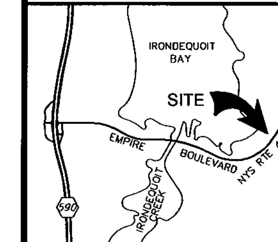


Town of Penfield

LOCATION SKETCH

N.T.S.


Client:

**Southpoint Cove LLC**
**1170 Pittsford-Victor Road**
P.O.Box 1660
Pittsford, NY 14534
**Robert Morgan (585)419-9630**

**Passero Associates**

100 Liberty Pole Way
Rochester, New York 14604
(585) 325-1000
Fax: (585) 325-1691

Principal-in-Charge John F. Caruso, P.E.
Project Manager Jess D. Sudol, P.E.
Designed by Carole G. Harvey


Revisions

| No. | Date | By | Description |
|---|---|---|---|
| 1 | | | |



REMEDIAL ACTION WORK PLAN ALTERNATIVE 4

SOUTHPOINT COVE APARTMENTS

Town/City: Penfield
County: Monroe State: New York

Project No. 20121461.01

Drawing No.

Sheet No. 3 of 3

Scale: 1"=50'

Date OCTOBER, 2012

# APPENDICES

# Appendix 1 - Remedial Action Alternatives Cost Estimates

**Passero Associates**
Engineering Architecture

100 Liberty Pole Way
Rochester, NY 14604
585 325 1000
Fax: 585 325 1691

| | | | | | |
|---|---|---|---|---|---|
| **PROJECT:** | SOUTHPOINT ENVIRONMENTAL | **Project No.:** | 20121461 | **By:** | JDS |
| **LOCATION:** | TOWN OF PENFIELD | **Date:** | 7/18/2012 | **Reviewed By:** | |
| **CLIENT:** | | **Revised By:** | JDS | **Date:** | |

| ITEM NO. | DESCRIPTION | ESTIMATE QUANTITY | UNIT | UNIT PRICE | EST. QUAN. X UNIT PRICE |
|---|---|---|---|---|---|
| | **REMEDIAL ALTERNATIVE #2** | | | | |
| | | | | | |
| 1 | MOBILIZATION | 1 | LUMP SUM | $5,000.00 | $5,000.00 |
| | | | | | |
| 2 | SOIL EXCAVATION WORK FROM BCP | 20,000 | CY | $50.00 | $1,000,000.00 |
| | AND DISPOSAL OFFSITE IN LANDFILL | | | | |
| | | | | | |
| 3 | PLACEMENT OF TWO FOOT CAP (SOILS | 5,185 | CY | $15.00 | $77,775.00 |
| | IMPORTED FROM OFFSITE) | | | | |
| | | | | | |
| 4 | DEMARCATION LAYER | 1 | LUMP SUM | $2,500.00 | $2,500.00 |
| | | | | | |
| 5 | TRUCK WASH DOWN AND GENERAL | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | SITE MAINTENANCE | | | | |
| | | | | | |
| 6 | EROSION CONTROL | 1 | LUMP SUM | $5,000.00 | $5,000.00 |
| | | | | | |
| 7 | STABILIZATION OF DISTURBED AREAS | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | | | | | |
| 8 | LEGAL (EASEMENTS) | 1 | LUMP SUM | $25,000.00 | $25,000.00 |
| | | | | | |
| | INSPECTION | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | | | | | |
| | **TOTAL - ALTERNATE #2** | | | | **$1,145,275** |

**Passero Associates**
Engineering Architecture

100 Liberty Pole Way
Rochester, NY 14604
585 325 1000
Fax: 585 325 1691

**PROJECT:** SOUTHPOINT ENVIRONMENTAL | **Project No.:** 20121461 | **By:** JDS
**LOCATION:** TOWN OF PENFIELD | **Date:** 7/18/2012 | **Reviewed By:**
**CLIENT:** | **Revised By:** JDS | **Date:**

| ITEM NO. | DESCRIPTION | ESTIMATE QUANTITY | UNIT | UNIT PRICE | EST. QUAN. X UNIT PRICE |
|---|---|---|---|---|---|
| | **REMEDIAL ALTERNATIVE #3** | | | | |
| | | | | | |
| 1 | MOBILIZATION | 1 | LUMP SUM | $5,000.00 | $5,000.00 |
| | | | | | |
| 2 | COMPLETE SOIL EXCAVATION WORK | 70,000 | CY | $50.00 | $3,500,000.00 |
| | FROM BCP | | | | |
| | | | | | |
| 3 | IMPORTATION OF CLEAN SOILS | 40,000 | CY | $15.00 | $600,000.00 |
| | | | | | |
| 4 | TRUCK WASH DOWN AND GENERAL | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | SITE MAINTENANCE | | | | |
| | | | | | |
| 5 | EROSION CONTROL | 1 | LUMP SUM | $5,000.00 | $5,000.00 |
| | | | | | |
| 6 | STABILIZATION OF DISTURBED AREAS | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | | | | | |
| 7 | INSPECTION | 1 | LUMP SUM | $1,000.00 | $1,000.00 |
| | | | | | |
| | **TOTAL - ALTERNATE #3** | | | | **$4,131,000** |

**Passero Associates**
Engineering Architecture

100 Liberty Pole Way
Rochester, NY 14604
585 325 1000
Fax: 585 325 1691

**PROJECT:** SOUTHPOINT ENVIRONMENTAL **Project No.:** 20121461 **By:** JDS
**LOCATION:** TOWN OF PENFIELD **Date:** 7/18/2012 **Reviewed By:**
**CLIENT:** **Revised By:** JDS **Date:**

| ITEM NO. | DESCRIPTION | ESTIMATE QUANTITY | UNIT | UNIT PRICE | EST. QUAN. X UNIT PRICE |
|---|---|---|---|---|---|
| | **REMEDIAL ALTERNATIVE #4** | | | | |
| | | | | | |
| 1 | MOBILIZATION | 1 | LUMP SUM | $5,000.00 | $5,000.00 |
| | | | | | |
| 2 | SELECTIVE REMOVAL OF PCB'S AND LEAD | 1,500 | CY | $50.00 | $75,000.00 |
| | | | | | |
| 3 | SOIL EXCAVATION WORK FROM BCP | 20,000 | CY | $3.00 | $60,000.00 |
| | | | | | |
| 4 | REPLACEMENT OF SOILS IN BCP | 1,000 | CY | $4.00 | $4,000.00 |
| | | | | | |
| 5 | SAMPLING FOR HAZARDOUS MATERIALS | 1 | LUMP SUM | $15,000.00 | $15,000.00 |
| | | | | | |
| 6 | PLACEMENT OF TWO FOOT CAP (SOILS | 5,185 | CY | $4.00 | $20,740.00 |
| | FROM BCP & BORROW PIT) | | | | |
| | | | | | |
| 7 | DEMARCATION LAYER | 1 | LUMP SUM | $2,500.00 | $2,500.00 |
| | | | | | |
| 8 | IMPORTATION OF CLEAN SOILS | 0 | CY | $0.00 | $0.00 |
| | | | | | |
| 9 | TEMPORARY STOCKPILE INCLUDING | 15,000 | CY | $4.00 | $60,000.00 |
| | SIGNAGE | | | | |
| | | | | | |
| 10 | TRUCK WASH DOWN AND GENERAL | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | SITE MAINTENANCE | | | | |
| | | | | | |
| 11 | EROSION CONTROL | 1 | LUMP SUM | $5,000.00 | $5,000.00 |
| | | | | | |
| 12 | STABILIZATION OF DISTURBED AREAS | 1 | LUMP SUM | $10,000.00 | $10,000.00 |
| | | | | | |
| 13 | LEGAL (EASEMENTS) | 1 | LUMP SUM | $25,000.00 | $25,000.00 |
| | | | | | |
| 14 | INSPECTION | 1 | LUMP SUM | $40,000.00 | $40,000.00 |
| | | | | | |
| | **TOTAL - ALTERNATE #4** | | | | **$332,240** |

# Appendix 2 - Community Air Monitoring Plan

**Community Air Monitoring Plan**

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area may be necessary. VOCs and radiological contamination are not concerns at this Site, but heavy metals will require particulate monitoring. However, VOC monitoring will also be conducted as a precaution.

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

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

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

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

# Appendix 3 - Quality Assurance Project Plan

# Field Sampling
# Quality Assurance Project Plan

**Quality Assurance Project Plan For**
**Remedial Investigation Work Plan**
**New York State Title 14 Brownfield Cleanup Program**
**1440 Empire Boulevard**
**Town of Penfield, New York**

## Prepared For:

**Upstate Brownfield Partners LLC**

*Submitted To:*

New York State Department of Environmental Conservation
Division of Environmental Remediation
6274 East Avon Lima Road
Avon, NY 14414

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Rochester, NY 14604


OCTOBER 2012

John F. Caruso, PE ______________________ Date ______________________

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## APPENDICES

# 1. INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared as a supplement to the Remedial Action Work Plan (RAWP) for investigation of the site known as 1440 Empire Boulevard in the Town of Penfield, New York (NYSDEC Site #C828135) (Site). The Site has been accepted into the Brownfield Cleanup Program.

This site specific QAPP describes the measures to be taken in the field and in the laboratory to ensure that samples collected during the investigation are collected, handled, and analyzed in an appropriate manner. This QAPP was developed to assure that all environmental data generated for the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation are scientifically valid, representative, and of known and acceptable precision and accuracy.

This QAPP builds upon prior work and earlier submissions. Familiarity with the Site and these prior submissions is assumed.

*NOTE: This QAPP was prepared in reference to soil samples only. No groundwater samples and no air samples will be collected while implementing the RAWP at the Site.*

## 2. PROJECT DESCRIPTION

The Site is an approximately 4.4-acre portion of a larger 16.67-acre parcel. The Site is zoned for commercial and residential use and is located on the northern side of Empire Boulevard (NYS Route 404) at the southern end of Irondequoit Bay in the Town of Penfield, Monroe County, New York.

Under the RAWP, the Site will be designated for restricted residential use, and all soils with PCB levels at or above 10 ppm or lead levels at or above 400 ppm will be removed and disposed of in a permitted solid waste landfill (except any soils with PCB contamination above 50 ppm would be managed as hazardous waste). A portion of the other soils in the Areas of Concern (AOCs) would be excavated to allow for the construction of the proposed buildings for an apartment complex, and related infrastructure including roadways, parking lots, and utilities, and buried onsite in a Borrow Pit area located adjacent to the Site. All remaining disturbed soils in the AOCs (including soils contaminated with PCBs below 10 ppm) would be capped with either asphalt, a concrete building slab, or a minimum of two feet of clean soil cover. Institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and a Site Management Plan would be implemented to protect against exposure and also control site use.

The clean soils in the Borrow Pit would be excavated and used as structural fill and for the two-foot cap on disturbed areas in the AOC. Soils excavated and removed from the Borrow Pit would be sampled and approved in accordance with Section 5.4 of DER-10. Additional soils from the Borrow Pit will be utilized in other areas of the development off the BCP Site.

The void created from the removal of the clean soils would then be filled using the excavations from the AOCs. Prior to placement in the Borrow Pit, the contaminated soil removed from the AOCs would be placed in stockpiles situated within the BCP Site. The stockpiles would be equipped with appropriate erosion control measures including but not limited to silt fencing and straw mulch stabilization. Stockpiled soils that do not require off-site disposal would then be preferentially used within the limits of the BCP Site for backfill below hard cover areas (structures/parking areas) and below the two foot soil cover where soils would be exposed.

Any of these contaminated stockpiled soils not placed back in the BCP Site would then be placed in the Borrow Pit and demarcated from the underlying clean soil in with an orange snow fence. Prior to placement of the contaminated stockpiled soils in the Borrow Pit, the soils from the stockpile would be sampled in accordance with the soil exportation criteria in Section 5.4 of DER-10. After the earthwork is completed, all soils placed in the Borrow Pit would then be capped with two feet of clean soils. The clean soils used for the two foot cap in the Borrow Pit would be soils that are initially excavated from the Borrow Pit and stockpiled outside the limits of the BCP Site.

The importation and export of soils to and from the BCP Site is subject to sampling requirements and restrictions detailed in Section 5.4 of DER-10. The Borrow Pit area is not located within the BCP Site, therefore soils moved to and from the Borrow Pit are also subject to these requirements. During excavation, any identifiable solid waste, and non-exempt construction and demolition debris (as defined by 6 NYCRR Part 360-7), would be segregated for off-site disposal.

## 3. PROJECT ORGANIZATION AND RESPONSIBILITY

This section of the QAPP details the specific roles, activities, and responsibilities of key project participants, as well as the lines of responsibility and communication within and between organizations. Passero Associates (PA) will provide services pertaining to the planning and implementation of remedial measures at the site, as required under the BCP.

Passero Associates' technical program management responsibility resides with John F. Caruso, PE, Senior Vice President of Civil Engineering and Survey. The Project Director will assign senior technical personnel to provide their expertise for the required technical activities and will assure consistency in technical approach and product deliverables. On a project specific basis, Mr. Caruso is responsible for technical review of reports to ensure that the quality of data and reports are technically sound and complete, and suitable for the project objectives. Mr. Caruso will report technical progress to communications recipients as specified in the Brownfield Cleanup Agreement (BCA).

The PA project manager, a senior scientist or engineer, will supervise technical activities and will draw from PA's staff in conjunction with Ravi Engineering and Land Surveying, P.C.'s (RE&LS) staff of qualified specialists including hydrogeologists, engineers, and environmental scientists to perform the specific project activities associated with this remedial investigation program. The organizational structure provided below assures that the project team is responsive and that there is a direct line of communication to the NYSDEC. The project organization chart is presented in Figure 1. The project personnel and their responsibilities are indicated below.

**Project Manager** -- *John F. Caruso, PE Senior Vice President of Civil Engineering and Survey*
The Project Manager will ensure that the overall project objectives are met and that the Remedial Action Work Plan, Quality Assurance Project Plan, and Health and Safety Plan (HASP) are followed throughout all phases of this project. He will be responsible for the development and implementation of the sampling work plan, as well as the assignment of field sampling personnel and the coordination of all project activities and subcontractors. He will be responsible for the submission of samples to the analytical laboratory, and will be the recipient of analytical and field reports. He is responsible for the compilation of data and technical report preparation. He will convey data to the Quality Assurance Coordinator for review.

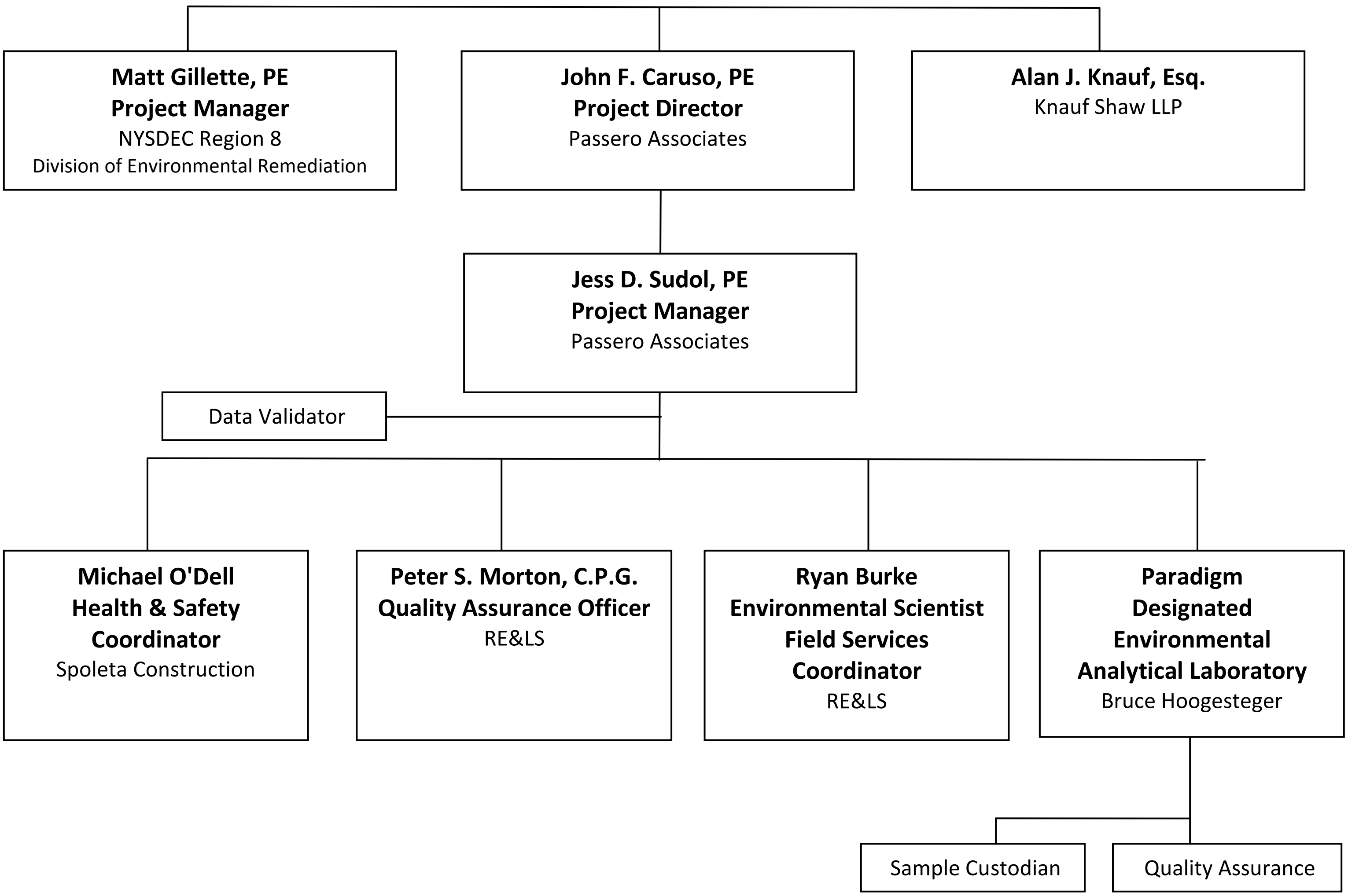
**Quality Assurance Officer** -- *Peter S. Morton, C.P.G., Senior Geologist*
The Quality Assurance Officer (QAO) will be responsible for ensuring that the quality of the data and the reports are suitable for the project objectives. His primary QA responsibilities will be to provide review and guidance on all quality aspects of the project. He will review and validate all sample collection procedures and analytical results. As the QAO, he will have authority to approve or disapprove project work plans, specific analyses and final reports. The QAO will work closely with the laboratory, the project manager and field personnel to ensure that the QAPP is being implemented. The QAO will report to the Project Manager.

**Health and Safety Coordinator** -- *Michael O'Dell, Site Superintendent*
The Health and Safety Coordinator (HSC) will be responsible for on-site implementation of the Site Health and Safety Plan (HASP) that conforms to applicable health and safety requirements to ensure that health and safety is not compromised during on-site environmental activities. The HASP provides site task specific health and safety requirements that are to be followed during fieldwork to ensure that workers are properly protected while meeting the objectives of the QAPP.

**Field Services Coordinator** -- *Ryan Burke, Environmental Scientist*
The Field Service Coordinator (FSC) will be responsible for sample collection and monitoring activities at the site. The FSC will ensure that sample collection is performed according to methods detailed in Section 5 of this report, entitled Sampling Procedures, and will ensure that the requirements and objectives of the QAPP for the collection are met.

**Laboratory Sample Custodian**
The laboratory sample custodian will be responsible for receiving, logging and storing samples as they are submitted to the analytical laboratory from PA. The sample custodian will ensure the completeness of the chain of custody form, which contains specific information such as sample collection data, analytical parameters, and analysis priority. The sample custodian will also ensure that holding times are within requirements and that sample custody is maintained.

**Figure 1. Project Organization Chart**



# 4. MEASUREMENT PERFORMANCE CRITERIA

## 4.1. DATA QUALITY OBJECTIVES

The overall objective of the sampling and analysis activities is to achieve an acceptable level of confidence in the analytical data generated in order to evaluate the quality of soil at the subject property. These data will be used to confirm the level of on-site contamination pursuant to the BCP; to characterize the soil for removal from, and importation to, the Site; and to confirm that program-required cleanup objectives have been met. The methods and the procedures used to implement and achieve the data quality objectives (DQOs) are described throughout this QAPP.

Data Quality Objectives are qualitative and quantitative statements that specify the purpose, quality, and/or quantity of the environmental data required to support management and remedial decisions at the site. DQOs are predicated in accordance with the anticipated end uses of the data that is to be collected. Data collected typically will be used to meet the following DQOs:

- Determine the level of contamination in soils excavated from the Site so that, consistent with the RAWP, soils can be directed to the Borrow Pit area, or must be transported off-site as solid or hazardous waste.
- Determine if soils left in place meet contaminant goals set forth in the RAWP.
- Determine if soils imported from the Borrow Pit area meet restricted residential standards to they can be utilized on-Site.

Data quality indicators (DQI) are qualitative and quantitative descriptors used to interpret the degree of acceptability or usability of data. The five principal DQIs are (1) precision, (2) accuracy, (3) representativeness, (4) comparability, and (5) completeness. Representativeness and comparability are qualitative parameters incorporated into the design and rationale of the sampling plan. Representativeness is achieved by selecting sampling locations that typify the survey areas. Comparability of data is accomplished by using only New York State Department of Environmental Conservation (NYSDEC) or United States Environmental Protection Agency (U.S. EPA) approved sampling and analytical methods. The three quantitative measurements, precision, accuracy, and completeness, are defined below.

When analyzing environmental samples, all measurements will be made so that results are reflective of the medium and conditions being measured. The level of detail and data quality needed will vary with the intended use of the data. DQOs typically are assessed by evaluating the precision, accuracy, representativeness, completeness, and comparability of all aspects of the data collection process, defined as follows:

### 4.1.1. Data Precision

Precision is a measure of agreement among replicate measurements of the same property under similar conditions. Precision is achieved by using consistent sampling procedures and measurement techniques established for a parameter or an analyte (prescribed similar conditions). Precision is assessed through calculation of relative percent difference (RPD) or relative standard deviation (RSD). Precision is calculated for laboratory duplicates, field duplicate samples, and matrix spike/matrix spike duplicates (MS/MSD). Field duplicate samples will be collected at a frequency of one per sample batch.

Laboratory duplicate samples, separate from field duplicate samples, will be analyzed to gauge analytical precision. The designated laboratory will analyze duplicate samples for each matrix under investigation at the frequency specified in Section 10 of this QAPP. Representative samples will be selected and analyzed in duplicate, and two portions of a representative sample will be spiked with matrix compounds and analyzed in duplicate. The results of these two analyses will be compared to assess the precision of the analytical system. Table 4.1 lists acceptance criteria for accuracy, precision, and completeness for each of the analytical methods specified. The criteria (predetermined acceptance limits) are expressed as numerical values.

#### 4.1.2. Accuracy

Accuracy is the measure of the propinquity of an individual measurement or average number of measurements to the true value (known concentration). Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations. Accuracy is expressed as the percent difference between a measurement and an accepted or true value.

#### 4.1.3. Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected under ideal conditions. Completeness (percent) is calculated by dividing the number of valid measurements by the number of planned measurements and multiplying by one hundred. Valid measurements include unqualified and estimated results that are usable for data interpretation. Estimated results cannot be verified as precise and accurate, but may be usable as long as associated limitations are considered by the data users and project DQOs can be met. Rejected results or results not reported due to sample loss or error negatively impact completeness.

Completeness will be evaluated by carefully comparing project objectives with the proposed data acquisition scheme and the resulting potential data gaps in the required information. The goal for completeness for this project is greater than 95 percent.

#### 4.1.4. Representativeness

Representativeness is the degree to which sampling data accurately and precisely depicts selected characteristics such as parameter variations at a sampling point or an environmental condition.

#### 4.1.5. Comparability

Comparability is the degree of confidence with which one data set can be compared to another.

To assess if environmental measurements are of an appropriate quality, the general requirements above will be examined and compared to agency-recommended parameters when available. Calculation of precision and accuracy should be specified in the site-specific work plan and/or SSQA. Samples should be collected in a manner so they are representative of both the chemical composition and physical state of the sample at the time of sampling. To ensure comparability, all data will be reported as Celsius (flash point), pH units, µg/l or mg/l for water and liquids, µg/kg or mg/kg for soil, sediment or other solids, and mg/m3 for air. Comparability is further addressed by using appropriate field and laboratory methods that are consistent with current standards of practice as approved by EPA.

## Table 4.2 Reporting Limits and Analytical Data Quality Objectives For Soil Analysis

| Analysis | Reference Method | Units | Target Reporting Limits | Precision Objectives | | Accuracy Objectives | | Completeness (%) |
|---|---|---|---|---|---|---|---|---|
| | | | | Field Duplicate Analysis (RPD) | MS/MSD Duplicate Analysis (RPD) | Matrix Spike Analyses (%Recovery) | Laboratory Control Sample Analyses (%Recovery) | |
| Cyanide | (SW846) 9010C | ug/l | 10 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Hexavalent Chromium | (SW846) 7196A | ug/l | 10 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Aluminum | (SW-846) 6010C | ug/l | 200 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Arsenic | (SW-846) 6010C | ug/l | 10 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Barium | (SW-846) 6010C | ug/l | 200 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Beryllium | (SW-846) 6010C | ug/l | 5 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Cadmium | (SW-846) 6010C | ug/l | 5 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Calcium | (SW-846) 6010C | ug/l | 5000 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Chromium | (SW-846) 6010C | ug/l | 10 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Cobalt | (SW-846) 6010C | ug/l | 50 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Copper | (SW-846) 6010C | ug/l | 25 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Iron | (SW-846) 6010C | ug/l | 100 | < 50 | < 20 | 80-120 | 80-120 | 95 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Lead | (SW-846) 6010C | ug/l | 10 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Magnesium | (SW-846) 6010C | ug/l | 5000 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Manganese | (SW-846) 6010C | ug/l | 15 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Mercury | (SW-846) 6010C | ug/l | 0.2 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Nickel | (SW-846) 6010C | ug/l | 40 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Potassium | (SW-846) 6010C | ug/l | 5000 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Selenium | (SW-846) 6010C | ug/l | 35 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Silver | (SW-846) 6010C | ug/l | 10 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Sodium | (SW-846) 6010C | ug/l | 5000 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Thallium | (SW-846) 6010C | ug/l | 25 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Vanadium | (SW-846) 6010C | ug/l | 50 | < 50 | < 20 | 80-120 | 80-120 | 95 |
| Zinc | (SW-846) 6010C | ug/l | 60 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 2-Butanone | (SW-846) 6010C | ug/l | 100 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Carbon Disulfide | (SW-846) 6010C | ug/l | 100 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 2,6-Dinitrotoluene | (SW-846) 6010C | ug/l | 100 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Benzene | (SW-846) 6010C | ug/l | 60 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| n-Butylbenzene | (SW-846) 6010C | ug/l | 12,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| sec-Butylbenzene | (SW-846) 6010C | ug/l | 11,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Ethylbenzene | (SW-846) 6010C | ug/l | 1,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Isopropyltoluene | (SW-846) 6010C | ug/l | 2,300 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| p-Isopropyltoluene | (SW-846) 6010C | ug/l | 10,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Methyl-Tert-Butyl-Ether | (SW-846) 6010C | ug/l | 930 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Naphthalene | (SW-846) 6010C | ug/l | 12,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| n-Propylbenzene | (SW-846) 6010C | ug/l | 3,900 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Tert-Butylbenzene | (SW-846) 6010C | ug/l | 5,900 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Toluene | (SW-846) 6010C | ug/l | 700 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 1,2,4-Trimethylbenzene | (SW-846) 6010C | ug/l | 3,600 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 1,3,5-Trimethylbenzene | (SW-846) 6010C | ug/l | 8,400 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Vinyl Chloride | (SW-846) 6010C | ug/l | 20 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Xylene (Mixed) | (SW-846) 6010C | ug/l | 260 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Acenaphthene | (SW-846) 6010C | ug/l | 20,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Acenaphthylene | (SW-846) 6010C | ug/l | 100,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Anthracene | (SW-846) 6010C | ug/l | 100,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Benzo(a)Anthracene | (SW-846) 6010C | ug/l | 1,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | (SW-846) 6010C | ug/l | 1,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Benzo(b)fluoranthene | (SW-846) 6010C | ug/l | 1,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Benzo(g,h,i)perylene | (SW-846) 6010C | ug/l | 100,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Benzo(k)fluoranthene | (SW-846) 6010C | ug/l | 800 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Chrysene | (SW-846) 6010C | ug/l | 1,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Dibenzo(a,h)Anthracene | (SW-846) 6010C | ug/l | 330 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Fluoranthene | (SW-846) 6010C | ug/l | 100,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Fluorene | (SW-846) 6010C | ug/l | 30,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Indo(1,2,3-cd)pyrene | (SW-846) 6010C | ug/l | 500 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| m-Cresol(s) | (SW-846) 6010C | ug/l | 330 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Naphthalene | (SW-846) 6010C | ug/l | 12,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| o-Cresol(s) | (SW-846) 6010C | ug/l | 330 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| p-Cresol(s) | (SW-846) 6010C | ug/l | 330 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Pentaclorophenol | (SW-846) 6010C | ug/l | 800 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Phanthrene | (SW-846) 6010C | ug/l | 100,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Phenol | (SW-846) 6010C | ug/l | 330 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Pyrene | (SW-846) 6010C | ug/l | 100,000 | < 50 | < 20 | 85-120 | 85-120 | 95 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2,4,5-TP Acid (Silvex) | (SW-846) 6010C | ug/l | 3,800 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 4,4'-DDE | (SW-846) 6010C | ug/l | 3.3 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 4,4'-DDT | (SW-846) 6010C | ug/l | 3.3 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| 4,4'-DDD | (SW-846) 6010C | ug/l | 3.3 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Aldrin | (SW-846) 6010C | ug/l | 5 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Alpha-BHC | (SW-846) 6010C | ug/l | 20 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Beta-BHC | (SW-846) 6010C | ug/l | 36 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Chlordane (alpha) | (SW-846) 6010C | ug/l | 94 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Delta-BHC | (SW-846) 6010C | ug/l | 40 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Dibenzofuran | (SW-846) 6010C | ug/l | 700 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Dieldrin | (SW-846) 6010C | ug/l | 5 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Endosulfan I | (SW-846) 6010C | ug/l | 2,400 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| EndosulfanII | (SW-846) 6010C | ug/l | 2,400 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Endosulfan sulfate | (SW-846) 6010C | ug/l | 2,400 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Endrin | (SW-846) 6010C | ug/l | 14 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Heptachlor | (SW-846) 6010C | ug/l | 42 | < 50 | < 20 | 85-120 | 85-120 | 95 |
| Lindane | (SW-846) 6010C | ug/l | 100 | < 50 | < 20 | 85-120 | 85-120 | 95 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ploychlorinated Biphenyls | (SW-846) 6010C | ug/l | 100 | < 50 | < 20 | 85-120 | 85-120 | 95 |

**KEY**

ug/l - microgram per liter
MS/MSD - matrix spike, matrix spike duplicate
RPD - Relative Percent Difference
SW - Solid Waste

# TABLE 4.2 DUPLICATE FREQUENCIES

| ACTIVITY | FREQUENCY | BENEFIT |
|---|---|---|
| Field Duplicate | one in 20 | Data shows precision of analytical scheme from sampling through analysis when compared with results of sample. This represents a blind QC sample to the laboratory. Collect an additional amount of sample. |
| Laboratory Duplicate | one in 20 | Data shows precision of analytical scheme within the laboratory. The difference between this precision and that of the field duplicate represents the precision of the analytical method. |
| Laboratory Spike | one in 20 | Data shows how well the analysis of interest can be performed, and recovered from the sample matrix. Such information is useful when reported value is near an action level, but the sample exhibits poor recovery. |
| Matrix Spike / Matrix Duplicate (inorganic) | one in 20 | Data shows precision of laboratory analysis when compared with results of sample. Collect an additional amount of sample for each analysis. Analyzed as unspiked sample. |
| Matrix Spike / Matrix Duplicate | one in 20 | Data shows precision of analysis when compared with matrix spike duplicate and matrix effects from recovery of spiked analysis. Collect an additional amount for each analysis. Analyzed as a spike. |
| Field Blank / Equipment Blank | As required by the DQOs | Data demonstrates that sampling equipment was clean prior to use. Pass a sample of reagent water through collection device. Submit for analysis of analytes of concern. |
| Trip Blank | As required by the DQOs | Data demonstrates that sample was not contaminated with volatile organics by other samples in shipping container, laboratory or outside influences. |
| Background or Reference Sample | As required by the DQOs | Data provides baseline information to evaluate environmental impact. |
| Split Samples / Inter-laboratory Split Sample | When required to meet DQOs | Compare the quality of laboratory procedures of the permittee with State contracted laboratory procedures. Collect an additional amount of sample for each analysis. |
| ***NOTE:*** This table is provided to serve as a guide only; AQA/AQC sample requirements should be developed on a site-specific basis. Laboratory blanks and surrogate spikes are method specific and are not included in this table (see NYSDEC ASP). For information on sampling refer to the *NYSDEC, Division of Water Sampling Manual.* | | |

# 5. SAMPLING PROCEDURES

In order to achieve the Data Quality Objectives, soil samples will be collected from areas of concern described in the Remedial Investigation (RI).

The following sections describe the sampling procedures for the collection of soil samples at the site, as well as the quality control requirements.

## 5.1. SOIL SAMPLES

### 5.1.1. Soil Sample Collection

As described in the RAWP, several pockets of soil are identified with elevated levels of lead or the polychlorinated biphenyl (PCB) Aroclor 1254 at concentrations greater than the Part 375 restricted residential use soil cleanup objectives (SCO). Prior to conducting a Track 4 remediation consisting of the capping the site contamination with either a building, parking lot or a minimum of two feet of clean soil cover, these areas in exceedance of 400 ppb lead (the restricted residential SCO) or 10 ppb PCBs (as required by CP-51) are proposed for excavation and off-site disposal at a permitted landfill.

After contaminated soil removal, confirmatory soil samples will be collected to verify that the remaining pit soils have residual levels of lead or PCB that are in conformance with the applicable standard. The samples will be directly by gloved hand and the soils will be placed into laboratory-supplied two ounce glass jars. The jars will be labeled, recorded on a chain of custody (COC) form, and placed into a sample cooler(s) for transport to the laboratory.

### 5.1.2. Soil Sampling Handling and Analysis

All sample jars will be supplied by the selected lab and will meet ASP Exhibit I criteria. Sample jars will be placed in a cooler with proper chain of custody, and transported to a NYS DOH ELAP approved laboratory. These samples will be analyzed for:

Method 6010B/7471A – Lead, and
Method 8082A - PCBS

The soils determined to have elevated levels of lead of PCBs will be excavated and staged on polyethylene sheeting. Upon completion, the staged soil piles will be sampled and characterized for landfill approval. These analyses will include:

RCRA Metals
TCL VOCs
TCL SVOCs
Pesticides
Herbicides
PCBs
Ignitability
Corrosivity/pH
Reactive Sulfide / Cyanide

Passero Associates and Ravi Engineering & Landscaping Survey PC field sampling personnel will wear clean latex gloves (or equivalent) during all sample collection procedures and equipment decontamination. Gloves will be changed when starting at a new sample location to prevent cross contamination. The contaminants present at this site will likely pose no significant risk due to the low level of contaminants; therefore, modified Level D personnel protection is required.

### 5.2. SAMPLING QA/QC

Passer Associates and Ravi Engineering & Landscaping Survey will use new sample containers that are precleaned to U.S. EPA protocols, which are compatible with the analytes of interest. Chemical preservatives, where necessary, will be added by the laboratory prior to shipping sample containers. After a sample is collected, PA and RE&LS's field personnel will take the necessary steps to preserve the chemical and physical integrity of the sample during shipment and storage prior to analysis. All samples will be capped immediately after sample collection and labeled. Table 5.2 lists the sample parameters, containers, preservation, holding times and the analytical methods.

**TABLE 5.2**
**SAMPLING CONTAINERS, PRESERVATION AND HOLDING TIMES**

| Parameter | Method | Matrix | Container | Preservation | Holding Times |
|---|---|---|---|---|---|
| Pest/PCBs | EPA 8081 | Soils | Glass wide-mouth w/TFE lines septum cap/4 oz. | None | 5 days until extraction 40 days from extraction until analysis **(1)** |
| VOCs | 5035/8260 | Soils | 40 ml. vial with septum cap | Sample is extruded into an empty sealed vial and cooled to 4 ± 2°C for no more than 48 hours then frozen to < -7 °C upon laboratory receipt | 14 days |
| SVOCs | EPA 8270 | Soils | 4 oz. Glass wide-mouth w/PTFE lined lid | Cool to ≤ 6 °C | Samples extracted within 14 days and extracts analyzed within 40 days following extraction |
| TAL Metals (except Hg) | EPA 6010 | Soil | Polyethylene 1 qt. (250 ml for soil borings) | 4°C | 6 months |
| Mercury | EPA 7471 | Soils | 4 oz. Glass wide-mouth w/PTFE lined lid | Cool to ≤ 6 °C | 28 days |
| | **(1)** Technical Times (time from sample collection until sample analysis) will be used to audit results. | | | | |

# 6. DOCUMENTATION AND CHAIN OF CUSTODY

## 6.1. FIELD DOCUMENTATION

Passero Associates and Ravi Engineering and Land Surveying, P.C. field sampling personnel will collect and accurately record relevant sample collection information on a field sampling data sheet, which is legibly prepared and maintained for each sample location. The information documented on the field sampling data sheet includes the name of the person(s) performing the sample collection, the date, project information, site location information, time of collection, analytes to be tested, and other specific information as may be necessary.

Passero Associates and Ravi Engineering and Land Surveying, P.C. field sampling personnel will prepare a label in indelible ink for each of the samples collected that includes the following information:

- Project Name
- Date and Time of Sample Collection
- Sample Location
- Sample Number
- Sample Parameters And Matrix
- Name of Sample Collector

Field QA/QC documentation for site characterization reports and/or remedial action/risk management reports must consider the following details:

- Calibration and maintenance records for field instrumentation (if applicable),
- Documentation of sample collection procedures,
- Reporting of any variances made in the field to sampling plans, SOPs or other applicable guidance documents,
- Reporting of all field analysis results,
- Documentation of sample custody (provide copies of chain-of-custody documents),
- Documentation of sample preservation, handling and transportation procedures,
- Documentation of field decontamination procedures (and if applicable, collection and analysis of equipment rinsate blanks),
- Collection and analysis of all required duplicate, replicate, background and trip blank samples, and
- Documentation of disposal of investigation-derived wastes.

## 6.2. SAMPLE CUSTODY

Proper Chain-of-Custody procedures will be implemented. Once a sample is collected, containerized, and labeled, Passero Associates and Ravi Engineering and Land Surveying, P.C. personnel will enter the appropriate information on the Chain-of-Custody form. This custody record will provide the necessary information to cross reference the sample number to the specific sampling location and will provide the date and time of collection as well as documentation of custody. The chain of custody document includes the following information:

- Project Name and Address
- Signature and Printed Name of Sampler
- Date and Time of Sample Collection
- Sample Type and Matrix
- Sample Number and Location
- Number of Sample Containers per Location
- Identification of the Parameters for which Sample is to be Analyzed
- Signature and Printed Name of Relinquisher of Samples
- Signature and Printed Name of Receiver of Samples
- Sample Turnaround Time
- QA/QC Type
- Any Comments and Special Instructions

All samples will be accompanied by a Chain of Custody form which will be signed and dated with the time also referenced by Passero Associates and Ravi Engineering and Land Surveying, P.C. field sampling personnel. The field sampling personnel will maintain custody of the samples until delivery to the analytical laboratory. Containers will be kept in a secure cooler, within visual contact of field sampling personnel, or in a locked vehicle or room. Only Passero Associates and Ravi Engineering and Land Surveying, P.C. field sampling personnel will have access to the samples. Chain of Custody documentation will accompany the samples to the analytical laboratory. The field chain of custody terminates upon laboratory receipt of the samples.

## 6.3. LABORATORY DOCUMENTATION

Once the samples reach the laboratory, the lab's sample custodian will accept custody of the samples and verify that the information on the sample labels matches that on the chain of custody form(s). The sample custodian will also check for any breakage or leakage that may have occurred during shipment or transport to the laboratory. The sample custodian will then enter the appropriate data into the laboratory tracking system during which a unique laboratory number will be assigned to each sample. The samples are then transferred to the appropriate analyst or the samples will be stored in a designated secure area. The use of Category B deliverables is for all samples, including imported and exported soils, other than interim documentation samples which can be analyzed with Category A deliverables.

Laboratory QA/QC documentation for site characterization reports and/or remedial action/risk management reports must consider the following details:

- If the published analytical method used specifies QA/QC requirements within the method, those requirements must be met and the QA/QC data reported with the sample results;
- At a minimum, QA/QC samples must consist of the following items (where applicable): method/instrument blank, extraction/digestion blank, initial calibration information, initial calibration verification, continuing calibration verification, laboratory fortified blanks/laboratory control samples, duplicate, and matrix spikes/matrix spike duplicates;
- Documentation of appropriate instrument performance data such as internal standard and surrogate recovery.
- The laboratory will provide NYSDEC ASP Category B deliverables.

## 7. CALIBRATION PROCEDURES AND FREQUENCY

Calibration is the process of establishing the relationship of a measurement system output to a known stimulus or quantity. Generally, calibration procedures are required for both field and laboratory instrumentation. In essence, calibration is a reproducible reference point to which all sample measurements can be correlated. This section describes the calibration procedures and the calibration frequency.

### 7.1. FIELD INSTRUMENTS

The field instruments to be utilized include Rae MiniRae 2000 photo ionization detection (PID) and DustTrak™ Model 8520 Aerosol Monitor fugitive dust meter.

The PID will be set up as follows:
Rae MiniRae 2000 P.I.D.

Start-up/zeroing/Calibration

- Attach probe tip and hydrophobic filter by screwing it to the unit.
- Press the MODE button to turn the unit on and let it warm up for 5-10 minutes in clean ambient air.
- The unit will display its settings during the warm up sequence. NOTE: *If calibrating, now is a good time to fill a tedlar bag with isobutylene.*
- When the unit has finished its warm up it will display a ppm reading.
- To enter the calibration mode, simultaneously press the MODE and N/- buttons until the screen displays ―Calibrate/ select Gas?‖
- Press Y/+
- Ensure that the unit is drawing clean ambient air or from a zero air source.
- "Fresh air cal?" is displayed. Press Y/+.
- The unit will display "zero in progress" followed by "wait" and a 15 second countdown.
- When the unit is finished zeroing it will display "Zeroed! Reading 0.0 ppm."
- Press Mode once.
- The unit comes from Pine Env. Set for 100 ppm Isobutylene. If your cal. Gas is 100 ppm isobutylene, skip the next five steps. If your gas is not 100 ppm, conduct the following:

Changing the span value

- From the "Span cal" screen, press the N/- button twice or until the screen reads
- "Change span value." Press Y/+.
- The screen will read "Cal gas = isobutylene, Span value = 0100. "Press the Mode button to move to cursor, and the Y/+ and N/- buttons to increase/decrease the span value to match your cylinder.
- When finished changing the value, press and hold the MODE button.
- The screen will read "Save?" Press the Y/+ button to save. The screen will read "Saved."
- Press the MODE button until "Span cal" is displayed.
- Span cal? is displayed.
- Press Y/+. The screen will read "Cal gas = Isobutylene, Span value = 0100.0, Apply gas now!"

- Open and connect a full tedlar bag of isobutylene to the probe tip. If the pump sounds like its restricted, the bag is not enough. The unit will recognize the gas and start to span. The screen will read "Wait" while it counts down from 30 seconds. Some newer units will display, "Update data" after the countdown.
- When the countdown is finished the screen will read "cal'ed reading = 100 ppm" It should read within a few ppm of the span value.
- Press MODE once. The screen will read "cal done turn off gas." Remove and close the tedlar bag.
- Press the MODE button twice to return to the run mode. The unit should read 0.0 ppm without gas and 100ppm with gas.
- The P.I.D. is calibrated and now ready for use.

## 7.2. DUSTTRAK™ MODEL 8520 AEROSOL MONITOR

Operation Overview:

- A DustTrak Environmental Enclosure will be used in conjunction with the DustTrak monitor.
- The battery pack within the Environmental Enclosure will be changed every 24 hours of use during the daily maintenance check described in the Maintenance Section.
- The DustTrak monitor will always we zeroed before beginning sample.
- Before each sample, the flow rate will be verified and/or adjusted.

The following Checklist will be followed before sampling:

- The flow rate will be set to 1.7 liters/minute.
- The DustTrak monitor will be zeroed at the temperature at which it will be sampling (if possible).
- The Environmental Enclosure has been put in place clear of any obstructions that will affect the flow around the enclosure.
- The Enclosure will not be resting directly on the ground (no standing water).
- The DustTrak monitor will be set to the appropriate logging mode.
- The Enclosure will be locked shut to prevent theft or vandalism to instrument.
- Plans will be made to check for maintenance and data collection every 24 hours after initial set up.

Maintenance:

- Daily Maintenance Checks - the DustTrak monitor will be checked a minimum of once a day to change the battery pack and make sure the instrument is operating properly.
- Cleaning the Aerosol Inlet - The external aerosol inlet will be checked to ensure that it is clean and unobstructed.
- When to Change the Battery - To ensure uninterrupted operation, the battery packs will be replaced daily.
- Recharging the Battery Packs - The following steps will be followed to correctly recharge the battery packs:
    - Disconnect the battery pack from the DustTrack monitor and remove it from the Environmental Enclosure
    - Take it to a protected area where it can be charged undisturbed for 12 to 15 hours.

- Check the bottom of the charger to see that the red voltage switch is set approximately to either 115V or 230V.
- Supply power to the charger. The green LED lights on the front of the charger.
- Insert the power plug protruding from the battery pack into the output jack attached to the charger. The charger will now quick-charge the battery. This is indicated by an illuminated yellow LED.
- Charging is complete when the yellow LED shuts off. A trickle charge will maintain the full charge. A fully charged battery will require up to 15 hours to fully charge.

**7.3. LABORATORY INSTRUMENTS**

Laboratory instruments will be subject to all the QA/QC procedures stated in the lab's qualifications and certifications packages. Before samples are analyzed on an instrument, chemical or physical calibration standards will be analyzed to establish that the instrument is functioning properly with the desired sensitivity. Calibration solutions will be documented with the preparer's initials, date of preparation, concentration of solution, and standard materials used to prepare the solution. All standard materials used in the preparation of calibration solutions conform to the U.S. EPA, National Bureau of Standards (NBS).

## 8. SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

The soil samples will be prepared and analyzed by the laboratory according to the matrix specific methods listed above from the following references.

1. Test Methods for Evaluating Solid Waste; SW-846. USEPA Office of Solids Waste and Emergency Response, Washington, D.C. 3rd Edition, 1986.
2. Standard Methods for the Analysis of Water and Wastewater, American Public Health Association, Washington, D.C. 16th Edition, 1985
3. EPA Water and Wastewater 600/4-79-020

The laboratory does not anticipate the need to modify standard procedures for referenced methods. The laboratory may use more stringent criteria based on statistical evaluation or laboratory practice. In such instances the laboratory-specific criteria will be used for data validation purposes as long as the criteria are more stringent than the targets set for this project. The reporting limits have been previously listed in Table 4.1.

## 9. DATA REDUCTION, VALIDATION, AND REPORTING

Data management, including chain-of-custody review and correction, data review, reduction and transfer to data management systems, quality control charts, quality control procedures, and sample receipt, storage and disposal, will be in accordance with applicable SOPs and accepted industry practices.

Documentation will be in accordance with applicable SOPs and accepted industry practices, and will include the sampling reports, copy of the chain-of-custody, and field QA controls with the analytical results. All sample documents will be legibly written in ink. Any corrections or revisions to sample documentation shall be made by lining through the original entry and initialing and dating any changes. Data reduction will occur in accordance with contractor analytical SOPs for each parameter. If difficulties are encountered during sample collection or sample analysis, a description of the problem will be provided in the sampling report prepared by contractor. Data reporting will be in accordance with applicable SOPs and will include, at a minimum:

- Sample documentation (location, date and time of collection and analysis, etc.)
- Chain-of-custody forms
- Initial and continuing calibration
- Determination and documentation of detection limits
- Analyte(s) identification
- Analyte(s) quantitation
- Quality Control sample results
- Duplicate results

Adequate precautions will be taken during the reduction, manipulation, and storage of data in order to prevent the introduction of errors or the loss or misinterpretation of data.

To ensure that measurement data generated when performing environmental sampling activities are of an appropriate quality, all data will be validated. Data validation is a systematic procedure for reviewing a body of data against a set of established criteria to provide a specified level of assurance of its validity prior to its intended use. The techniques used must be applied to the body of the data in a systematic and uniform manner. The process of data validation must be close to the origin of the data, independent of the data production, and objective in its approach. The review will evaluate the data in terms of adherence to sampling and analysis protocols and to quality control criteria outlined in this QAPP. The criteria for data validation include checks for internal consistency, duplicate sample analysis, spike addition recoveries, instrument calibration and transcription errors. The acceptance or rejection of data, depending on the adherence to the quality control criteria, will be in a uniform and consistent manner based on established validation criteria and as provided in this QAPP.

All data, as applicable, will be validated in accordance with EPA guidance, per Data Quality Objectives Process. Any deviations will be documented and provided with the analytical data report. The DUSR will also contain copies of result forms with any changes made to the results by the data validator. The DUSR will be prepared in accordance with DER-10, Appendix 2B.

The raw data will be reported in concentrations to two significant figures. Premature rounding of intermediate results can significantly affect the final result. Therefore, the reported results will be rounded to the correct number of significant figures only after all calculations and manipulations are completed. As many significant figures as are warranted by the analytical method will be used in reporting calculations. Only data meeting the validation criteria will be reported. Percent recovery and relative percent difference values will also be reported using two significant figures. Compounds that are not detected will be reported as less than the analytical method detection limit.

The final analytical data reports will be submitted to the Passero Associates Project Manager and Quality Assurance Coordinator for their review and acceptance of the data in terms of completeness with respect to technical requirements of the project. All data will be assessed for accuracy, precision, completeness, representativeness and comparability. These data will then be presented in a technical report prepared by Passero Associates. Upon receipt of validated analytical results, NYSDEC format electronic deliverables (EDDs) that are compatible with EqUIS will be prepared and submitted to NYSDEC.

## 10. INTERNAL QUALITY CONTROL CHECKS

The work plan for this site contains quality control requirements as they apply to each sampling task. Matrix spikes and duplicates will be analyzed per matrix in a sample group. Refer to Table 4.2 for QA/QC frequencies. For the purposes of this investigation the following quality control measures will be utilized by the laboratory:

| Measure | Parameter | Frequency |
|---|---|---|
| Matrix Spike/Matrix Spike Duplicate | Organics | As necessary |
| Matrix Spike / Replicate | Inorganics | As necessary |
| Reagent Blank Sample | Organics and Inorganics | As necessary |
| Surrogate Spike Sample | Organics | As necessary |
| Calibration | Organics and Inorganics | As necessary |
| Field Blanks | Organics and Inorganics | 1 per sampling |
| Trip Blanks | Organics and Inorganics | 1 per cooler |
| Equipment Blanks | Organics and Inorganics | N/A |
| Field Replicates | Organics and Inorganics | N/A |

## 11. PERFORMANCE AND SYSTEM AUDITS

Passero Associates and Ravi Engineering and Land Surveying, P.C. will document inspections and audits to confirm the quality or orderly progression of a portion of the work by outlining the procedures, acceptability of methods or personnel, qualifications, or other verifications of quality. Performance audits (performance samples) and system audits (site inspections) of the fixed laboratories are performed by the New York State Department of Health as part of the laboratory certification process. No audits for laboratories are scheduled as part of this project.

## 12. PREVENTIVE MAINTENANCE

Preventive maintenance activities are performed in order to prevent loss of data due to malfunctions or delay. Critical functions are identified for field and laboratory and contingencies are accordingly established.

In order to minimize downtime of field sampling and monitoring equipment, all equipment will be cleaned and visually inspected before and after each day of use. Where applicable, all equipment will be charged when not in use and calibrated each day.

The subcontracted analytical laboratory employs a qualified technician for analytical instrument maintenance. An inventory of spare parts is maintained to minimize instrument downtime. Laboratory balances are under service contracts to the manufacturers.

### 12.1. FIELD ACTIVITIES

The critical functions in the field require that extra sampling containers be on hand in the field, ready for use. Field screening kits and reagents may also be maintained as appropriate. Alternative sources (such as an instrument rental agency) for field screening or health and safety related monitoring devices may be identified prior to going into the field. This contingency will prevent loss of data or delays.

### 12.2. LABORATORY ACTIVITIES

The laboratory QA/QC plan will outline a formal preventive maintenance program including contingencies for sending samples to an alternate NYS certified laboratory if samples requiring analysis within the regulatory holding times are going to be compromised. Major and critical equipment should be on a service contract or under a laboratory program staffed by equipment technicians capable of emergency service. Back-up instrumentation should be available for larger projects. Routine maintenance for equipment will be performed.

## 13. DATA ASSESSMENT PROCEDURES

The procedures used to assess the precision, accuracy, and completeness of the data generated will begin with a review of the field notes and documents that correspond to the laboratory data report being reviewed. Any unusual or questionable observations will be noted and compare to the corresponding data. The following will be considered for all data:

1. Shipping information.
2. Adherence to holding times.
3. Calibration documentation.
4. Comparison of field assigned sample numbers and laboratory assigned sample numbers.
5. Comparison of values assigned to QA/QC samples (field and trip blanks, duplicates, method blanks and laboratory spiked samples) and environmental samples.
6. Review of chromatograms/spectra for values and tentatively identified compounds.
7. Units of measure reported.
8. Laboratory calculations.
9. Laboratory determined method detection limits.
10. Sample documentation.

Any errors, mistakes or deviations from the analysis requested identified by the data assessment will be presented in a validation report developed by the QA/QC Officer. Based on the validation report, Passero Associates, the data users, will determine whether the data is usable for their purposes.

## 14. CORRECTIVE ACTIONS

Once the final report is submitted, the DEC Project Manager will review the field duplicates to determine if they appear to indicate a problem with meeting quality objectives. If problems are indicated, the Project Manager will contact the contractor to discuss and attempt to reconcile the issue. Completeness will also be evaluated to determine if the completeness goal for this project has been met. If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling may occur. The Project Manager will determine the cause of the failure (if possible) and make the decision to discard the data and re-sample. If the failure is tied to the analyses, calibration and maintenance techniques will be reassessed as identified by the appropriate lab personnel. If the failure is associated with the sample collection and re-sampling is needed, the sampling methods and procedures will be reassessed as identified by the field audit process.

Corrective action will be undertaken by all parties to address specific problems as they arise. Corrective actions required will be identified through the use of control charts for chemical analyses, precision and accuracy data, through performance auditing, and through systems audits.

In the event corrective actions are required to rectify an out of control laboratory or field measurement system the following steps will be taken by the QA/QC Officer:

1. Identification and definition of the problem;
2. Assignment of responsibility for investigating the problem;
3. Investigation and determination of the cause of the problem;
4. Determination of a corrective action to eliminate the problem;
5. Assigning and accepting responsibility for implementing the corrective action;
6. Implementing the corrective action and evaluating its effectiveness; and
7. Verifying that the corrective action has eliminated the problem.

## 15. QUALITY ASSURANCE REPORTS TO MANAGEMENT

The QA/QC Officer will report the status of the QA/QC program to the program management upon completion. The report will include the following components:

- Assessment of measurement data accuracy, precision, and completeness
- Significant QA/QC problems and recommended solutions
- Resolutions of previously stated problems

Field reports will describe the status of the project, daily field progress reports, compiled field data sets, and corrective action documentation at appropriate intervals. Laboratory analytical reports will include a summary of all quality assurance activities and quality control data for the project as related to the sample analysis. The Project Manager will be notified immediately of any laboratory quality assurance situations requiring immediate corrective action.

The project management organization and the regulatory agency will be notified of all situations that indicate an imminent health risk. Written notification with supporting data will be forwarded within three business days.

# APPENDICES

# APPENDIX A - GLOSSARY OF QA/QC TERMS

## GLOSSARY OF QUALITY ASSURANCE AND RELATED TERMS

**acceptance criteria** — address the adequacy of existing information proposed for inclusion into the project. These criteria often apply to data drawn from existing sources (―secondary‖ data).
**accuracy** — a measure of the overall agreement of a measurement to a known value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations; EPA recommends using the terms *"precision"* and *"bias*,‖ rather than ―accuracy,‖ to convey the information usually associated with accuracy.
**assessment** — the evaluation process used to measure the performance or effectiveness of a system and its elements.
**audit** — a systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives.
**bias** — the systematic or persistent distortion of a measurement process that causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value).
**blank** — a sample subjected to the usual analytical or measurement process to establish a zero baseline or background value. Sometimes used to adjust or correct routine analytical results. A sample that is intended to contain none of the analytes of interest. A blank is used to detect contamination during sample handling preparation and/or analysis.
**chain-of-custody** — an unbroken trail of accountability that ensures the physical security of samples, data, and records.
**collocated samples** — two or more portions collected at the same point in time and space so as to be considered identical. These samples are also known as field replicates and should be identified as such.
**comparability —** a measure of the confidence with which one data set or method can be compared to another.
**completeness —** a measure of the amount of valid data obtained from a measurement system.
**conformance** — an affirmative indication or judgment that a product or service satisfies the relevant specification, contract, or regulation.
**corrective action** — any measures taken to rectify conditions adverse to quality and, where possible, to prevent recurrence.
**data quality** — a measure of the degree of acceptability or utility of data for a particular purpose.
**data quality assessment** — the scientific and statistical evaluation of data to determine if data obtained from environmental operations are of the right type, quality, and quantity to support their intended use.
**data quality indicators** — the quantitative statistics and qualitative descriptors used to interpret the degree of acceptability or utility of data to the user. The principal data quality indicators are bias, precision, accuracy (bias is preferred), comparability, completeness, representativeness, and sensitivity.
**data quality objectives** — the qualitative and quantitative statements derived from the DQO Process that clarifies study's technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.
**data quality objective process** — a systematic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use. DQOs are the qualitative and quantitative outputs from the DQO Process.
**data reduction** — the process of transforming the number of data items by arithmetic or statistical calculations, standard curves, and concentration factors, and collating them into a more useful form. Data reduction is irreversible and generally results in a reduced data set and an associated loss of detail.
**data validation** — an analyte- and sample-specific process that extends the evaluation of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of a specific data set.
**data verification** — the process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual specifications.
**design** — the specifications, drawings, design criteria, and performance specifications. Also, the result of deliberate planning, analysis, mathematical manipulations, and design processes.

**detection limit** — a measure of the capability of an analytical method to distinguish samples that do not contain a specific analyte from samples that contain low concentrations of the analyte; the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability. DLs are analyte- and matrix-specific and may be laboratory-dependent.

**document control** — the policies and procedures used by an organization to ensure that its documents and their revisions are proposed, reviewed, approved for release, inventoried, distributed, archived, stored, and retrieved in accordance with the organization's specifications.

**environmental conditions** — the description of a physical medium (for example, air, water, soil, sediment) or a biological system expressed in terms of its physical, chemical, radiological, or biological characteristics.

**environmental data** — any measurements or information that describe environmental processes, location, or conditions; ecological or health effects and consequences; or the performance of environmental technology. For EPA, environmental data include information collected directly from measurements, produced from models. Compiled from other sources such as data bases or the literature.

**environmental data operation** — work performed to obtain, use, or report information pertaining to environmental processes and conditions.

**environmental monitoring** — the process of measuring or collecting environmental data.

**environmental processes** — any manufactured or natural processes that produce discharges to, or that impact, the ambient environment.

**environmental technology** — an all-inclusive term used to describe pollution control devices and systems, waste treatment processes and storage facilities, and site remediation technologies and their components that may be used to remove pollutants or contaminants from, or to prevent them from entering, the environment. Examples include wet scrubbers (air), soil washing (soil), granulated activated carbon unit (water), and filtration (air, water). Usually, this term applies to hardware-based systems; however, it can also apply to methods or techniques used for pollution prevention, pollutant reduction, or containment of contamination to prevent further movement of the contaminants, such as capping, solidification or vitrification, and biological treatment.

**field blank** — a clean analyte-free sample which is carried to the sampling site and then exposed to sampling conditions, returned to the laboratory, and treated as an environmental sample. This blank is used to provide information about contaminants that may be introduced during sample collection, storage, and transport.

**financial assistance** — the process by which funds are provided by one organization (usually governmental) to another organization for the purpose of performing work or furnishing services or items. Financial assistance mechanisms include grants, cooperative agreements, and governmental interagency agreements.

**graded approach** — the process of applying managerial controls to an item or work according to the intended use of the results and the degree of confidence needed in the quality of the results.

**guidance** — a suggested practice that is not mandatory, intended as an aid or example in complying with a standard or specification.

**holding time** — the period of time a sample may be stored before analysis. While exceeding the holding time does not necessarily negate the veracity of analytical results, it causes the qualifying or ―flagging‖ of any data not meeting all of the specified acceptance criteria.

**independent assessment** — an assessment performed by a qualified individual, group, or organization that is not a part of the organization directly performing and accountable for the work being assessed.

**inspection** — the examination or measurement of an item or activity to verify conformance to specifications.

**matrix spike sample** — a sample prepared by adding a known amount of the target analyte to a specified amount of a matrix. Spiked samples are used, for example, to determine the effect of the matrix on a method's recovery efficiency.

**measurement quality objectives —** the individual performance or acceptance goals for the individual Data Quality Indicators such as precision or bias.

**metadata** — information that describes the data and the quality criteria associated with their generation.

**method** — a body of procedures and techniques for performing an activity (for example, sampling, chemical analysis, quantification), systematically presented in the order in which they are to be executed.

**method blank** — a blank prepared to represent the sample matrix as closely as possible and analyzed exactly like the calibration standards, samples, and quality control (QC) samples. Results of method blanks provide an estimate of the within-batch variability of the blank response and an indication of bias introduced by the analytical procedure.
**outlier** — an extreme observation that is shown to have a low probability of belonging to a specified data population.
**parameter** — a quantity, usually unknown, such as a mean or a standard deviation characterizing a population. Commonly misused for ―variable,‖ ―characteristic,‖ or ―property.‖
**performance criteria** — address the adequacy of information that is to be collected for the project. These criteria often apply to new data collected for a specific use (―primary‖ data).
**precision** — a measure of agreement among repeated measurements of the same property under identical, of substantially similar, conditions; expressed generally in terms of the standard deviation.
**process** — a set of interrelated resources and activities that transforms inputs into outputs. Examples of processes include analysis, design, data collection, operation, fabrication, and calculation.
**proficiency test** — a type of assessment in which a sample, the composition of which is unknown to the analyst, is provided to test whether the analyst/laboratory can produce analytical results within the specified acceptance criteria.
**quality** — the totality of features and characteristics of a product or service that bears on its ability to meet the stated or implied needs and expectations of the user.
**quality assurance** — an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the customer.
**quality assurance project plan** — a formal document describing in comprehensive detail the necessary quality assurance procedures, quality control activities, and other technical activities that need to be implemented to ensure that the results of the work performed will satisfy the stated performance or acceptance criteria.
**quality control** — the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the specifications established by the customer; operational techniques and activities that are used to fulfill the need for quality.
**quality control sample** — an uncontaminated sample matrix spiked with known amounts of analytes from a source independent of the calibration standards. Generally used to establish intra- laboratory or analyst-specific precision and bias or to assess the performance of all or a portion of the measurement system.
**quality management plan** — a document that describes the quality system in terms of the organization's structure, the functional responsibilities of management and staff, the lines of authority, and the interfaces for those planning, implementing, and assessing all activities conducted.
**quality system** — a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out quality assurance procedures and quality control activities.
**readiness review** — a systematic, documented review of the readiness for the start-up or continued use of a facility, process, or activity. Readiness reviews are typically conducted before proceeding beyond project milestones and before initiation of a major phase of work.
**record** — a completed document that provides objective evidence of an item or process. Records may include photographs, drawings, magnetic tape, and other data recording media.
**recovery** — the act of determining whether or not the methodology measures all of the analyte contained in a sample.
**representativeness** - the measure of the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.
**self-assessment** — the assessments of work conducted by individuals, groups, or organizations directly responsible for overseeing and/or performing the work.

**sensitivity** — the capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest.
**spike** — a substance that is added to an environmental sample to increase the concentration of the target analyte by known amount; used to assess measurement accuracy (spike recovery). Spike duplicates are used to assess measurement precision.
**split samples** — two or more representative portions taken from one sample in the field or in the laboratory and analyzed by different analysts or laboratories. Split samples are quality control samples that are used to assess analytical variability and comparability.
**standard operating procedure** — a document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps to be followed. It is officially approved as the method for performing certain routine or repetitive tasks.
**surveillance (quality)** — continual or frequent monitoring and verification of the status of an entity and the analysis of records to ensure that specifications are being fulfilled.
**technical systems audit** — a thorough, systematic, on-site qualitative audit of facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a system.
**validation** — an analyte- and sample-specific process that extends the evaluation of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of a specific data set.
**verification** — the process of evaluating the completeness, correctness, and conformance / compliance of a specific data set against the method, procedural, or contractual specifications.

# APPENDIX B - RESUMES

# GARY W. PASSERO, PE, F. ASCE, REM

*CEO*

## Representative Project Experience

Mr. Passero is the founder and Chief Executive Officer of Passero Associates. The firm was founded in 1972 and has grown to over 80 engineers, architects, planners, surveyors, and support personnel.

Throughout his professional career, Mr. Passero obtained design and management experience in a wide variety of environmental, civil and forensic engineering projects. His experience includes soil/groundwater investigation and remediation; indoor air quality sampling, evaluation and abatement (mold, asbestos, lead); civil/site engineering for residential, commercial, and industrial projects; municipal engineering/architecture; wastewater treatment/pollution control; sanitary landfills; highway/street design and reconstruction projects; and preparation of engineering reports for accident and failure cases.

Mr. Passero has provided expert testimony for plaintiffs and defendants, has participated in technical panels, and has been an Adjunct Professor at Rochester Institute of Technology.

*Gary is honored to have been selected as a 2003 & 2010 Finalist for Small Business Person of the Year by the Small Business Council, and as a 2010 Finalist and 1998 "Civil Engineer of the Year" by the Rochester Section, American Society of Civil Engineers. Gary is a Past President/Delegate for the New York State and District 1 Councils of the American Society of Civil Engineers.*

A partial list of projects Mr. Passero has managed:

## Environmental Projects

- 2,000 Phase I Environmental Site Assessments since 1990
- Comfort Inn Brownfield Cleanup Agreement; Gates, New York
- 37 Bittner Street Brownfield Cleanup Program; Rochester, New York
- Soils Management Plan, Phase I & Phase II Investigations, 200 Clifford Ave; Rochester, New York
- Speedy's Cleaner Brownfield Cleanup Program; Pittsford, New York
- Blue Cross/Blue Shield Remediation Site Plan; Rochester, New York
- Wireless Telecommunications Towers: Phase I & Phase II; Multiple Sites, Northeast US
- Rochester General Hospital Industrial Hygiene Services; Rochester, New York
- Town of Poughkeepsie, New York Police & Court Building Indoor Air Quality Investigation
- Speedy's Cleaner Soil/Groundwater Remediation
- Fischback & Moore Electric Voluntary Cleanup Agreement; Brighton, New York
- Town of Irondequoit, New York Underground Storage Tank Removal and Site Remediation
- Town of Macedon, New York Indoor Air Quality Investigation
- NYSDEC Brownfield Investigation at the Geneva Foundry and Market Basket Sites in Geneva, New York
- Environmental Assessment Impact Statements for General Aviation Airports in the Northeast United States

### Education

BS, Civil Engineering, Iowa State

### Post Graduate Work

- American Water Works Assoc., Improving Water Treatment Operations
- University of Wisconsin, Industrial Waste Institute Seminar
- State University of Buffalo, Chemical Principal of Water Pollution Control
- Cornell University, Land Application of Waste
- RCRA: Hazardous Waste Rules and Regulations

### Certifications/Registrations

- NCEES Registration #12550
- Licensed Professional Engineer in the States of New York, Florida, Ohio, Illinois, and Pennsylvania
- Registered Environmental Manager, (REM #5342)

### Civic/Professional Affiliations

- Fellow Member, Past President and Delegate, New York State and District 1 Councils, American Society of Civil Engineers
- Rochester Engineering Society
- New York State Society of Professional Engineers
- American Council of Engineering Companies
- National Director, Business Men's Fellowship USA and President, Rochester Regional Chapter

GARY W. PASSERO, PE, F. ASCE, REM
*CEO*

## Civil/Municipal Engineering Projects

### *Light Industrial /Commercial Office Buildings /Office Parks*

- Calkins Corporate Park (Professional Office)
- Canal View Office Park; Brighton, NY
- Lyons National Bank
- Mendon SQ - PHD (Professional Offices, Residential Homes, Multi-Family Townhomes and Retail Businesses)

### *Institutional Engineering Projects*

- 911 Emergency Center; Rochester, NY
- Intercampus Drive, University of Rochester
- Parking Expansion and Athletic Fields Relocation at Medical Center Campus, University of Rochester

### *Municipal Utility Design and Studies:*

- Lafayette Road Sanitary Sewer Diversion Project
- Multiple Municipal Sanitary Sewer Design, Studies & Pump Station Projects
- Town of Gates – Little Black Creek Drainage Study
- Town of Irondequoit Public Safety Building

### *Retail Design Projects*

- CVS Pharmacies (over 15) – Rochester & Upstate New York
- Elm Ridge Shopping Plaza; Greece, New York
- Tinseltown USA; Town of Gates, NY
- Wegmans Food Markets, Various Communities in Upstate NY

### *Municipal Street & Traffic Design:*

- Greater Rochester International Airport
- Hollenbeck Street Reconstruction
- NYS Rt. 33A Signal & Highway Improvements
- Turk Hill Road Reconstruction

### *Restaurants/Fast Food Projects*

- Boston Markets Restaurants; Rochester, NY
- Mario Via Abruzzi; Rochester, NY
- Wendy's Restaurants; Rochester, NY

## Forensic Engineering Projects

- Hannibal School Bus Accident Case for the Travelers Companies

- Member of the Construction Committee, Flower City Habitat for Humanity
- Board Member, St. Joseph's Villa
- Advisory Board Member, Celebration of Life Community
- Advisory Board Member, Roberts Wesleyan College
- Advisory Board Member, Finney School
- Camp Good Days Varsity Volunteer Program
- Past President and Member, Lakeshore Kiwanis Club
- Board of Directors, Open Door Mission
- Board of Directors, Camp DayDreams

## GARY W. PASSERO, PE, F. ASCE, REM
*CEO*

- Multiple Forensic Engineering Investigations and Reports for NYS Department of Law
- Rogan vs. Sear Brown Accident Case
- Stony Point Condominium Earthwork Dispute and Investigation
- Harbor Hill Structural Failure Investigation and Report
- Balkman vs. Moonan Lead Paint Poisoning
- SUNY Geneseo Townhouse Apartments Water Penetration Investigation and Report
- Stony Point Landing Slope Stability Investigation and Report

# JOHN F. CARUSO, PE, PMP

*Senior Vice President/Engineering Project Manager*

**John** is Vice President of Passero Associates. He has more than 25 years of civil engineering design and study experience. His experience includes municipal, residential, industrial, and commercial developments. John manages the firm's survey and site development departments.

### Education

- BS, Physics, State University of New York, Cortland
- BS, Civil Engineering, State University of New York, Buffalo

### Certifications/Registrations

- Licensed Professional Engineer in the States of New York, Ohio, and Florida
- Project Management Professional (PMP)

### Professional Affiliations

- Institute of Transportation Engineers (ITE)
- Project Management Institute (PMI)
- Professional Service Management Association (PSMA)

## Representative Project Experience

## Institutional Engineering Projects

**Roberts Wesleyan College Athletic Fields, Rochester, NY** — Project Manager/Coordinator responsible for design of NCAA soccer, softball and track and field facilities. Services included sewer, water and drainage design, town approvals, permits and community presentations.

**Homewood Suites Inn, Greece, NY** — Engineering Project Manager responsible for site layout, access and utilities of a five-million dollar Homewood Suites Inn with five floors and 100 guest rooms.

**Tompkins Cortland Community College New Residence Halls, Dryden, NY** — Project Manager responsible for engineering design, site design & approval, permit approvals, topographical and boundary survey for construction of two new 60,000 SF residence halls, each with a capacity of 134 beds, with a total cost of $17,000,000. The building construction is concrete block and plank.

**Albion Academy Apartments and Commercial Space; Albion, New York** — Engineering Project Manager responsible for a $7,000,000 major rehabilitation of a 55,000 square foot building from an educational institution into multi-family residential and mixed-use commercial space.

**Churchville Fire Department, Churchville, NY** — Project Engineering Manager for a new 19,000 SF fire hall and ambulance facility.

**Monroe County Inter-Agency Public Works Facility; Monroe County, NY** — Principal-in-Charge of $8.4M, 90,000 square foot project comprising several individual public works buildings, winner of an ACEC Platinum Award and APWA National and New York Project of the Year, representing the epitome of efficiency, land reclamation and reuse. Developed a "Reuse Plan" of the 50 acre decommissioned Gates-Chili Ogden Sewage Treatment Plant Site. Services included interviewing and programming eight (8) County Departments for their special needs intending to relocate to this site. Led a multi-disciplinary team of firms on this high-profile project.

**Medley Centre; Irondequoit, NY** — Principal-in-Charge as civil engineer of record for $250M redevelopment of 900,000 sq. ft. shopping mall in to a world-class, mixed-use project including hotels, a conference center, new retail, theaters, restaurants, offices and residences. Other notable technical feats include reevaluating the entire transportation and street network system in the Medley Centre and Irondequoit (East Ridge Road) area. The sizable traffic study concluded with state of the art traffic and transportation system upgrades and mitigation.

**Medley Centre Traffic Study; Irondequoit, NY** — Traffic Engineering Manager in charge of conducting a sizable traffic study that reevaluated the entire transportation and street network system in the Medley Centre and Irondequoit (East Ridge Road) area.

**Laidlaw Transit Bus Parking Lot; Rochester, New York** — Principal-in-Charge for $500,000 bus parking project, providing Road & Parking Lot Design services, including Traffic Engineering, Cost Estimating, Drainage Design, Lighting, Land-Use/Site, Photogrammeteric, SEQRA Compliance, and Sewage & Drainage System Design.

JOHN F. CARUSO, PE, PMP
*Senior Vice President/Engineering Project Manager*

**Baker Park Conceptual Design Plan, Chili, New York** — Principal-in-Charge of a concept plan and summary report for Baker Park. This project involved regular scheduled meetings with the Parks and Recreation advisory committee and the Parks and Recreation director to identify the needs and opportunities Baker Park property offers. Work involved various levels of programming followed by the preparation of conceptual planning.

**Land Use Analysis, Chili, New York** — Principal-in-Charge of a commercial land use and construction cost evaluation for the Town of Chili. The analysis evaluated land use alternatives, building/department programs and the estimated construction cost of the commercial development alternatives and their benefits to the community.

**Town of Chili Parks and Recreation Master Plan, Chili, New York** — Principal-in-Charge for update of the Town's 2001 Parks and Recreation Master Plan to meet the current and future recreational needs of the Town's residents, including identification of present and anticipated parks and recreational needs and capabilities; guidance of provision of land and facilities; establishment of directions for implementing, developing, financing, operation of and maintenance of facilities and programs; guidance of cost effective acquisition and development of recreational facilities; provision of necessary documentation of recreational needs for state, federal and other potential sources of assistance; providing data for short and long range capital planning and budgets and informing Town residents and officials of recreational needs, efforts and capabilities.

**Roberts Wesleyan College Golisano Library, Rochester, NY** — Principal-in-Charge as the civil and site engineering subconsultant to the design architect and Roberts Wesleyan College for the $10 million Library project. The design of the new Library on an existing parking lot required relocation of the displaced vehicles to an appropriate location with pedestrian access to the campus. The new Library site was selected to become the focal point for the campus with views from multiple locations. Responsible for Survey and Mapping, Site Design, Utility Design, Drainage Design (Phase II SPEDES), Vehicular and Pedestrian Access, Permitting, Cost Estimating, and Construction Administration

**Miller Performing Arts Center, University of Alfred, Alfred, NY** — Principal-in-Charge as the civil and site engineering subconsultant to the design architect and the University of Alfred for a $7 million Performing Arts Center. The Miller Performing Arts Center site was placed on the side of a 30° embankment. It required particular attention to utilities for constructability and erosion control/stabilization during construction. Responsible for Survey and Mapping, Site Design, Utility Design, Drainage Design, Vehicular and Pedestrian Access, Cost Estimating, Construction Administration.

**Strong Memorial Emergency Dept. Expansion, City of Rochester; Rochester, New York** — Project Manager in charge of design for emergency vehicle access, site design, and approvals.

**NCAA Collegiate Running Track & Athletic Field, University of Rochester; Rochester, New York —** Project Manager/Coordinator to design a NCAA Collegiate running track and athletic field. Services included sewer, water & drainage design, town approvals, permits and community presentations.

**Geneva General Hospital; Geneva, New York —** Project Manager/Engineer responsible for conducting a traffic impact analysis to determine the required improvements to provide safe pedestrian access, minimize delays to access Main Street, and coordinate signal lights. The Geneva General Hospital campus proposed significant traffic improvements to service existing and three proposed medical office buildings.

**Parking Expansion and Athletic Fields Relocation at Medical Center Campus, University of Rochester; Rochester, New York —** Engineer for a parking alternative analysis, design of parking lot expansion, conversion of existing lot into dual use for staff and visitor parking with parking control equipment, shuttle bus service, lighting and drainage. The project also included design of a new signalized intersection for lot access, replacement of soccer field, softball fields and truck throwing area.

**Intercampus Drive, Phase I, University of Rochester; Rochester, New York —** Project Engineer for a comprehensive planning and traffic study on the River Campus master plan to implement the first phase of road improvement projects that led to the closure of Wilson Boulevard and the opening of riverfront from public recreation and access.

**Wilson Boulevard Closure, University of Rochester; Rochester, New York —** Engineer responsible for coordinating and conducting traffic impact analysis simulating the closing of Wilson Boulevard.

- Geneva General Hospital, Campus-Wide Study; Geneva, NY
- Strong Memorial Hospital Lots 1, 2 and 3 Expansion
- Strong Memorial Hospital Medical Center Parking Study

- Roberts Wesleyan College Golisano Library, Rochester, NY
- Roberts Wesleyan College Entrance Signs, Rochester, NY
- Roberts Wesleyan College Track & Field/Stadium & Athletic Fields, Rochester, NY
- 911 Emergency Center; Rochester, NY

## Light Industrial / Commercial Office Buildings / Office Parks

**Rochester Genesee Regional Transportation Authority (RGRTA) Campus Upgrades** — Principal-in-Charge of Program Management and Preliminary Engineering Design Services for improvements to RGRTA Campus including the enclosed bus storage, improved employee parking, and better traffic flow throughout the campus.

**Barilla Semolina Storage Building; Avon, New York** — Principal-in-Charge for engineering services for this seven-story grain storage building at the new Barilla Pasta Plant, Distribution Center in Avon, New York. The 300,000 SF facility, with a total cost of $7M, sits on a 49-acre lot and will produce 100,000 tons of pasta a year.

**Nu-Look Collision; Henrietta, New York** — Principal-in-Charge of full site engineering and survey services for $1.2M flagship auto body repair center and corporate headquarters in Henrietta. Over 16,000 sq ft of state-of-the art design and construction completed on time and under budget. Building construction consists of a steel structure with masonry and metal-framed exterior walls. The facility includes a gas fired rooftop unit for the offices and gas fired radiant tub heaters for the repair center.

**Calkins Corporate Park; Henrietta, New York** — Principal-in-Charge for full site engineering and survey services for office park improvements. This project required special use permits for the use of commercial property in an Industrial zone along with a use variance zone after resubdivision of the parcels.

**Canal View Office Park; Rochester, New York —** Traffic Engineer responsible for a traffic analysis that identified the traffic impact as a result of several phases of construction. Projected traffic was generated as a function of gross square foot per phase of construction. The results of several intersection capacity analyses revealed the improvements required during each phase of this office park's development. Improvements consisted of left and right-turn lane construction, signal timing plans, signal light construction plans, and preparation of all geometric improvement plans.

**Elmgrove Industrial Park; Gates, New York —** Project Engineer responsible for the design of public utilities, roads, and lot grading, preparation of construction drawings and obtained local, county and state approvals, inspection of road construction and storm sewer installation; and preparation a traffic impact analysis.

**Gates Industrial Park; Gates, New York —** Project Engineer responsible for the design of public utilities, roads, and lot grading; obtained the NYSDEC permit for wetland mitigation; preparation of the construction documents and obtained local, county, and state approvals; conducted a traffic impact analysis; and preparation of individual site plans for each development lot pursuant to purchasers building layout and business needs.

**Frank Metal Corporation, City of Rochester; Rochester, New York —** Project Engineer responsible for the design of site access and maneuverability for several truck (hauling) sizes, at-grade and subgrade loading docks; utility connections for water sanitary, and storm water; site buffers and landscaping for aesthetics; obtained approvals through the City of Rochester; and preparation of construction documents.

**Promold Inspection Corporation, Town of Ogden; Ogden, New York —** Project Engineer responsible for the design of building layout on-site for tractor trailer access; design of septic system and water service connections; grading parking areas and remainder of lot; obtained approvals through the Town of Ogden; and preparation of the construction documents.

**Sealand Construction Office Building; Rush, New York —** Project Engineer responsible for the design of septic system, backflow preventer, and storm sewer connections; layout of building on-site, parking lot, loading dock access for tractor trailers; and obtained all necessary approvals for construction.

**Newbury Street Warehouse Building, City of Rochester; Rochester, New York —** Project Engineer responsible for the design of a 43,000 square foot building on parcel for maximum building square footage. Design included access roads and loading/unloading areas for tractor trail use; parking lot layout and drainage; storm, sanitary, and watermain to site; water meter pit and backflow preventor. He obtained approval through the City of Rochester and prepared construction documents.

**RTR Gun Wholesaler's Warehouse, City of Rochester; Rochester, New York —** Project Engineer responsible for the design of building layout on-site and tractor trailer access to building; all storm, sanitary, and water connections to building; grading the lot and parking lot for positive drainage; and obtained site plan approval through the City of Rochester.

**MDTCastle Inc.; Henrietta, New York —** Project Engineer for the design of 25,000 square foot building addition for service lot grading, loading dock access, fire main and site drainage. He obtained approval through the Town of Henrietta and prepared construction documents.

**Winmark Light Industrial Subdivision; Rush, New York —** Project Engineer responsible for the design of public utilities, roads, and grading for earth balance; prepared construction documents; obtained local, county, and state approvals; prepared individual site plans of each lot based upon purchasers building layout and access needs; design of individual disposal systems for each lot; and conducted a traffic impact analysis.

## Other examples of Industrial / Light Industrial design experience:

- Calkins Corporate Park (Professional Office)
- Canal View Office Park, Brighton, NY
- Cornell Business Park
- Elmgrove Industrial Park
- Gates Business Park (Professional Office)
- Pixley Industrial Park
- Sky Acres Professional Office Buildings
- Wegmans Food Markets – Geneva, Brockport (Food Markets)
- Westview Commons – Planned Unit Development (Professional Offices, Residential Homes, Multi-Family Apartments, Retail & Business Park)

## Utility Design and Studies

- American Planning Association's Panel Discussion Workshop Informing Local Municipalities on Cell Towers and Land Use
- Cell Tower Land Use Ordinance and Legislation Advisory; Village of Churchville, NY
- Chili Avenue Watermain- Extension
- Drainage Studies, Irondequoit; Gates & Chili, NY
- Interdepartmental Public Works Facility at the Gates-Chili Ogden Sewage Treatment Plant; Rochester, NY
- Jackson Road Watermain- Distribution, MCWA; Webster, NY
- Lafayette Road Sanitary Sewer Diversion Project
- Multiple Municipal Sanitary Sewer Design, Studies & Pump Station projects; Irondequoit, NY
- Multiple Site Development Plans and Assessment Plans
- Mt. Airy/Kendall Wood Sewer Diversion Project

## Street & Traffic Design

**Renaissance Square Parking and Traffic Analysis; Rochester, New York** — Traffic Engineering Manager for a parking and traffic study for the Renaissance Square project that analyzed the impact of converting North Clinton Avenue and St. Paul Street to two-way operation between East Main Street and the Inner Loop and the availability of parking in the area. The study analyzed 12 intersections within the study boundaries.

JOHN F. CARUSO, PE, PMP
*Senior Vice President/Engineering Project Manager*

**McLean Street Improvements; Rochester, New York —** Engineer for this project which involved the reconstruction and narrowing of the pavement section, new curbs, sidewalks, street lighting, and new treescape area. An extensive traffic impact study was done to analyze impact on change of function to a one-way street.

**Culver Road Corridor Analysis, Town of Irondequoit; Irondequoit, New York —** Engineer for the preparation of construction plans for recommended alternatives for road reconstruction, signal light improvements, maintenance of traffic plans, and pavement striping plans. His responsibilities included coordination of traffic analysis with the Monroe County Planning and Traffic Engineering Department, NYSDOT, and the Town of Irondequoit.

**South Union Street Rehabilitation; Rochester, New York —** Engineer for this project which involved the rehabilitation of a major arterial highway including the widening of pavement section, new curbs, sidewalks, street lighting, water main, traffic signals, and a new streetscape area. A traffic analysis was conducted to determine proper intersection alignment to eliminate unsafe traffic merge.

**Cooper Road Improvements, Town of Irondequoit; Irondequoit, New York —** Engineer responsible for coordinating and conducting corridor traffic analysis for the proposed road and geometric improvements to Cooper Road.

**Greater Rochester International Airport; Rochester, New York —** Traffic Engineer for the new access way to the airport for over one mile of one, two, and three lane roadway with and a 165 foot span curved girder bridge were designed to improve traffic movements around terminal area to maximize decision making time for one of three options that are available.

## Other Street Design Projects

- Avenue D Reconstruction
- Bayshore Boulevard Reconstruction
- Cooper Road Reconstruction
- Culver Road Phase II
- Cunningham Street Design; Rochester, NY
- Hollenbeck Street Reconstruction
- NYS Rt. 33A Signal & Highway for Movie Theater
- NYS Rt. 33A Signal & Highway Improvement for PUD
- Turk Hill Road Reconstruction
- Chili Ave. NYS Rt. 33 – Highway Improvements
- Wilson Boulevard, University of Rochester
- Intercampus Drive, University of Rochester

## Private Engineering Projects

### Retail

**Wegmans Food Markets; Brockport, New York —** Traffic Engineer for the 220,000 square foot retail plaza adjacent to the existing Brockport plaza. The traffic engineering report consisted of origination and destination analysis for the Brockport area, redistribution of existing traffic patterns through the Rte. 19 and Rte. 31 arterials, and intersection capacity analyses of existing and proposed signalized intersections. The scope of engineering further required the design of traffic control signal lights, lane geometric improvements, and construction plans of recommended improvements.

**Wegmans Food Markets; Geneva, New York —** Traffic Engineer responsible for the 85,000 square foot facility which required a traffic impact analysis to determine signal and lane improvement requirements. Signal plans and lane geometric plans were prepared for construction from the traffic report.

**Commerce Center Plaza of Coconut Creek; Coconut Creek, Florida —** Traffic Engineer responsible for the traffic analysis which required computations of traffic progressions along State Road No. 836 for proposed signalized intersections and their impact on the existing signalized intersections which are located less than 1,000 feet apart.

JOHN F. CARUSO, PE, PMP
*Senior Vice President/Engineering Project Manager*

**Wal-Mart; Geneseo, New York —** Traffic Engineer responsible for the preparation of the signal light plans and the highway improvement plans for this project. The project consisted of several lane geometric improvement designs (left-turn lanes through lanes, site driveways), preparation of the signal plans (includes phasing design), expediting plan review, and approvals with NYSDOT.

**Elm Ridge Plaza; Rochester, New York —** Traffic Engineer responsible for the preparation of the signal light plans and the highway improvement plans for this project. The project consisted of several lane geometric improvement designs (left-turn lanes through lanes, site driveways), preparation of the signal plans (includes phasing design), expediting plan review, and approvals with NYSDOT.

**Lyell-Spencerport Plaza; Rochester, New York —** Traffic Engineer responsible for the completion of a traffic analysis for a.m., p.m., and weekend peak hours for the development of this project. The traffic analysis recommended to close one of four existing entrances to improve traffic flow patterns and to signalize one existing entrance. A progression analysis was conducted to show the impact of a new signal light on the NYSDOT's highway between two existing lights. Signal Timing Optimization was conducted to achieve the most efficient timing to both main line and side street. A design report was prepared and submitted to the NYSDOT for a highway work permit.

**Genesee Valley Shopping Plaza, City of Rochester; Rochester, New York —** Traffic Engineer responsible for the preparation of signal plans and highway improvement plans to provide safe access to the site. This project consisted of constructing a Wal-Mart store and Wegmans Food Market in the same plaza.

**Maplewood Plaza, City of Rochester; Rochester, New York —** Traffic Engineer responsible for conducting a traffic impact analysis and recommend geometric improvements for a mixed-use, retail-fast food restaurant. The traffic study required generation of mixed trucks, cars, and tractor trailer vehicles. The analysis included lane geometric improvements to provide safe access to the State highways and provide tractor trailer accessibility.

**Pepper Tree Plaza; Coconut Creek, Florida —** Traffic Engineer responsible for conducting a traffic analysis which required computations of traffic progressions for proposed signalized intersections and their impact on the existing signalized intersections which are located less than 1,000 feet apart.

**CVS Pharmacy, Monroe Avenue; Rochester, New York —** Project Engineer responsible for the design and approvals for a CVS pharmacy.

- Baytowne Plaza; Penfield, NY
- CVS Pharmacies; Rochester & Upstate NY
- Elm Ridge Shopping Plaza; Greece, NY
- Henrietta Plaza; Henrietta, NY
- Hollywood Video Stores
- Lyell-Spencerport Plaza; Gates, NY
- Maplewood Plaza; City of Rochester, NY
- Over 15 CVS Pharmacy Sites
- Parts America - Lyell Avenue; Rochester, NY
- Pep Boys; City of Rochester, NY
- Ridge Goodman Plaza; Rochester, NY
- Several Wegmans Shopping Plazas in NY State
- Tinseltown USA; Gates and Hamburg, NY
- Wal-Mart Shopping Center; Geneseo, NY

- Wegmans Food Markets; Various Communities Upstate, NY
- Winton Place; Towns of Brighton and Henrietta, NY

### Restaurants / Fast Foods

- Atlanta Bread Company Restaurant
- Boston Markets Restaurants
- Burger King
- Mario Via Abruzzi
- Pelegrino's Café & Deli
- Taco Bell
- Tim Horton's
- Wendy's Restaurants

## Residential Projects

**1440 Empire Boulevard Development, Irondequoit, New York** — Principal-in-Charge for full design services for 100-unit condo project at the south end of Irondequoit Bay. Innovative stormwater management practices were used to construct the foundations in a manner that avoided compromising the adjacent NYSDEC wetlands and accounted for the site's proximity to the coastal erosion zone. Passero also provided traffic engineering services and designed traffic improvements to Empire Boulevard.

**Erie Harbor Development, Rochester, New York** — Principal-in-Charge of site design for this adaptive reuse site along the Genesee River to feature new market rate and affordable townhomes. Passero Associates is redesigning all of the infrastructure and working closely with the City of Rochester to integrate the project with the City's new waterfront park area.Engineering challenges of this project include designing the construction of the new buildings onto the existing foundations. The soil conditions in the area require preserving and maintaining the existing foundation's infrastructure to support the new structure.

**Bayfront Apartments, Greece, New York** — Principal-in-Charge for an innovaive approach to design for a 77-unit residential development alongside Long Pond, one of the first projects in the Monroe County area to meet new requirements of the Department of Environmental Conservation for waterfront development. Alternative Better Site Design practices were used by Passero engineers in the project layout and design. These include an organic filtering system that uses vegetation plantings to improve stormwater runoff, which is removed and treated for phosphorus in the filtering system.

### Apartments

- Autumn Woods, Senior Housing (92 Apartments); Henrietta, NY
- Blueberry Hill Apartments (180); Chili, NY
- Daniels Creek Apartments at Baytown Plaza; Penfield, NY
- Elizabeth Way Senior Housing (28 Homes) & (32 Townhomes); Farmington, NY
- Jordache Park Apartments; Ogden, NY
- Marketview Apartments; City of Rochester, NY
- Marketview Apartments Phase II; City of Rochester, NY
- Parklands of Chili; Chili, NY
- Salvation Army Men's Shelter (40 beds); City of Rochester, NY
- Stone Hedge Apartments; Farmington, NY
- Summit Knolls; Penfield, NY
- West Square Manor; City of Rochester, NY
- Westview Commons Apartments; Gates, NY

JOHN F. CARUSO, PE, PMP
*Senior Vice President/Engineering Project Manager*

## Town Homes

- Alloway Senior Housing (28 Homes) & (32 Townhomes); Farmington, NY
- Anthony Square (48 Town Homes); Rochester, NY
- Aprile Meadows (32); Geneseo, NY
- Canal Place Town Homes (32 Homes); Greece, NY
- Linhome Place (24 Homes); Henrietta, NY
- Riverview Townhomes (196 Town Homes); Chili, NY
- Valley Creek Condominiums

## Senior Living Facilities (# of units)

- Ada Ridge Senior Housing (48); Greece, NY
- Brentland Woods Senior Housing (90 Apartments); Henrietta, NY
- Briarwood Town Homes (32 Homes); Scottsville, NY
- Elmgrove Place (48 Apartments); Gates, NY
- Gateway Senior Housing (90 Homes); Gates, NY
- Hickory Hollow Patio Homes (100) and Senior Living Apartments (50); Ogden, NY
- Hobie Creek Apartments, (64 Apartments); Irondequoit, NY
- Ogden Senior Housing, (24 Apartments); Ogden, NY
- Parklands of Chili Landscape Senior Housing (80 Apartments); Chili, NY

## Single Family Homes

- Cherokee Bluff Subdivision
- Country Village Estates
- Edison Place
- Hickory Hollow Patio Homes
- Red Bud Subdivision
- Spring Brook Subdivision
- Stone Hill Estates
- Westchester Village Subdivision
- Westview Commons
- Whispering Winds Subdivision

## Hotels

- Fairfield Inn; Henrietta, NY
- Best Western; Henrietta, NY
- Hampton Inn; Brighton, NY
- Marriott Hotels
- Holiday Inn Airport; Gates, NY
- Best Western; Gates, NY
- Fairfield Inn at the Greater Rochester International Airport

JOHN F. CARUSO, PE, PMP
*Senior Vice President/Engineering Project Manager*

## Not-For-Profits

- Alloway Senior Housing (28 Homes) & (32 Townhomes); Farmington, NY
- Anthony Square (48 Town Homes); Rochester, NY
- Aprile Meadows (32); Geneseo, NY
- Autumn Woods, Senior Housing (92 Apartments); Henrietta, NY
- Briarwood Town Homes (32 Homes); Scottsville, NY
- Canal Place Town Homes (32 Homes); Greece, NY
- Elmgrove Place (48); Gates, NY
- Linhome Place (24 Homes); Henrietta, NY
- Salvation Army Men's Shelter (40 beds)
- Seldon Square II (96 Apartments); Clarkson, NY

**Glacier Ridge Subdivision; Watertown, New York —** Traffic Engineer responsible for the traffic analysis which recommended additional exiting lanes, included site distance calculations, and provided intersection capacity analysis of Rte. 11 and Rte. 342.

**Riverview Townhomes, Town of Chili; Chili, New York —** Traffic Engineer responsible for the traffic engineering report which included traffic generation, distribution, and a capacity analysis of the proposed entrance. Recommendations included road widening, lane improvements, and preparation of construction plans for road widening and lane improvements.

**Regional Draft Environmental Traffic Impact Analysis; Penfield, New York —** Traffic Engineer responsible for coordinating and conducting a traffic impact analyses for 1,000 residential homes within two square mile area.

**Squiredale Subdivision, Town of Greece; Greece, New York —** Traffic Engineer responsible for the inspection of public utilities and road construction in Sections 5, 6, and 7, and the design of Section 8.

**Hertfordshire Subdivision, Town of Victor; Victor, New York —** Traffic Engineer responsible for the design of a triplex booster pump station to service the domestic and fire flow needs of a 57 lot subdivision and the design of individual disposal system for multiple lot subdivision. Design was based on increasing the pressures in a controlled manner to meet I.S.O. and N.Y.S.H.D. requirements.

**Memory Care Residence at Cottage Grove; Rochester, NY** — Project Manager responsible for coordinating the design of Memory Care Residence at Cottage Grove, a 48-unit assisted living apartment complex on a 6.6 acre site. Project improvements included new utilities, parking, roadway infrastructure and pedestrian access.

## Child Care / Children's Facilities

**Little Learners Day Care Center; Syracuse, New York —** Traffic Engineer responsible for conducting a traffic report showing impact from a large traffic generator during the peak hours of a State highway. The engineering report recommended geometric improvements and entrance alignment in order to provide safe vehicular movement while minimizing conflicts.

- Kids Creation Arts & Crafts Activity Center; Penfield, NY
- Child Time Children's Centers; Gates, NY
- Gates Day Care Center; Gates, NY
- United Methodist Church; Rochester, NY
- Pepperhill Child Care Center; Rochester, NY

## Not-for-Profit Organizations

- Friendship Baptist Church
- Open Door Baptist Church
- Rochester Christian Church

- Salvation Army
- St. Pius X Federal Credit Union
- Holy Spirit Church
- Open Door Missions
- Most Precious Blood Church
- St. Theodore's

## Forensic Engineering Projects

**New York State Department of Law —** Engineer responsible for reconstructing and reviewing traffic accidents on State highways in which liability lawsuits have developed. His experience on projects includes accident report research, EBT review, geometric alignment review (per AASHTO and NYSDOT Design Manuals), sight distance calculations, pavement markings and road signage during normal operation and during construction periods, review of traffic volumes, maintenance records, and Manual of Uniform traffic Control Devices for preparation of accident study. His work experience includes preparation of exhibits and expert witness testimony during trial proceedings.

**Route 63; Oakfield, New York —** Traffic Engineer for the Syracuse Office Accident case for the New York State Department of Law which occurred on Route 63 in Oakfield, New York, Genesee County.

**Route 89; Butler, New York —** Traffic Engineer for the Syracuse Office Accident study for the New York State Department of Law conducting an accident study, including site investigation, research, and preparation of engineering report.

**Intersection Old Scottsville Road/Beaver Road, Town of Chili; Chili, New York —** Traffic Engineer for the Monroe County Department of Law for an accident scene investigation to determine highway design compliance with respect to traffic control, devices, signage and pavement markings.

**Route 37; Waddington, New York —** Traffic Engineer for Sugarman, Wallace, Manheim & Schoenwald investigating and reporting on an accident involving a vehicle hitting a construction flagman for Barrett Paving.

**Oswego County Route 3, Town of Hannibal; Hannibal, New York —** Traffic Engineer for the Travelers Companies for a site investigation, research, and preparation of an engineering report on a Hannibal bus-vehicle accident.

**Welling/Storch Accident Study for New York State Department of Law —** Syracuse Office, site investigation, research, preparation of engineering report for collision on Route 89 in Butler, New York.

**Arican Accident Case for the Monroe County Department of Law; Rochester, New York —** Accident scene investigation to determine highway design compliance with respect to traffic control, devices, signage and pavement markings (Intersection Old Scottsville Road/Beaver Road, Town of Chili, New York).

**Barrett Paving Accident for Sugarman, Wallace, Manheim & Schoenwald —** Investigated and reported on an accident involving a vehicle hitting a construction flagman on Route 37 in Waddington, New York.

**Hannibal School Bus Accident Case for the Travelers Companies —** Site investigation, research, and preparation of an engineering report on a bus-vehicle accident occurring on Oswego County Route 3 in the Town of Hannibal, New York.

- Multiple Forensic Engineering Projects & Services , NYS Department of Law
- NYS Dept. of Law- Multiple Forensic Engineering Studies

# JESS SUDOL, PE

*Associate/Project Manager/Engineer*

## Representative Project Experience

Jess has been project engineer on the following projects at Passero Associates:

### Institutional

**Jamestown Residence Halls; Jamestown, NY** — 110 Bed Residence Hall.

**Rockwood Center at Brentland Woods** — 40-unit Independent Car Facility.

**Masonic Care Community** — Assisted Living center in Utica, NY.

**Penfield YMCA; Penfield, NY** — Project Engineer and responsible for drainage design, site layout and land use approvals.

**The Fathers House; Chili, NY** — Designed and drafted a 116,000 SF church facility in the Town of Chili located on 42 acres. Design work included site layout, stormwater design for two retention ponds, sanitary sewer main, watermain service with backflow prevention and earthwork calculations.

**Rochester Genesee Regional Transportation Authority (RGRTA) Campus Upgrades** — Project Engineer involved in preparing the environmental review of the project for NEPA. This included researching noise levels, operations, cultural resources and a limited traffic study.

**Miller Performing Arts Center & Ceramics Building, University of Alfred, Alfred, NY** — Project Engineer responsible for site design, utility design, project approvals, stormwater management, grading and erosion control for a $7 million Performing Arts Center and a site design for a new 18,000 square foot Ceramics Museum separate Ceramics Building.

**SUNY Canton Student Housing; Canton, NY** — Project Engineer responsible for site design of a LEED Silver apartment style housing building that will accommodate 300 students.

**Tompkins Cortland Community College New Residence Halls; Dryden, NY** — Project Engineer responsible for site design, utility design, project approvals, stormwater management, grading and erosion control for construction of two new 60,000 SF residence halls, each with a capacity of 134-beds, with a total cost of $17,000,000.

**Roberts Wesleyan College Golisano Library, Chili, NY** — Silver LEED Certified Project. Site design for a new $10M 43,000 SF Library. Project included stormwater management, sanitary sewer, watermain, electric and gas design. Also, facilitated town and county approvals.

**University of Rochester Health Services Building, Rochester, NY**— Project Engineer responsible for site design, utility design, project approvals, stormwater management, grading and erosion control.

**Lafayette Fire Department; Lafayette, NY** — Designed and drafted a new pump station and raised fill septic system.

**Churchville Fire Department, Churchville, NY** — Project Engineer responsible for site design, utility design, project approvals, stormwater management, grading and erosion control for construction of a new 19,000 SF fire hall and ambulance facility.

**University of Rochester Chiller Plant; Rochester, NY** — Designed a 5-story Chilled Water Plant at the University of Rochester. Project included water service and backflow prevention design, sanitary sewer and storm design, demolition of existing infrastructure and Maintenance and Protection of Traffic for two open cut areas across Crittenden Boulevard.

**Jess** is a project manager and engineer at Passero Associates with over ten years of experience. Jess is part of the civil/site engineering group. He works on commercial, residential, and institutional projects. Jess specializes in large land development projects and navigating the SEQRA and Land Use Approval process. His ability to organize a project schedule and communicate with municipalities on all levels of civil engineering has resulted in many successful projects being delivered ahead of schedule and under budget.

#### Education

- BS, Civil Engineering Tech, Rochester Institute of Technology
- Autodesk and AutoCAD Civil Training

#### Professional Certifications

- Pennsylvania Licensed Professional Engineer
- Certified Professional in Erosion and Sediment Control (CPESC)
- PMI Project Management Training
- Certified Professional in Stormwater Quality (CPSWQ)

JESS SUDOL
*Project Manager/Engineer*

## Residential

**Southpoint Cove Apartments, Penfield, New York** — Project Manager for full design services for 350-unit condo project at the south end of Irondequoit Bay. Innovative stormwater management practices were used to construct the foundations in a manner that avoided compromising the adjacent NYSDEC wetlands and accounted for the site's proximity to the coastal erosion zone. Passero also provided traffic engineering services and designed traffic improvements to Empire Boulevard.

**Erie Harbor Development, Rochester, New York** — Project Engineer for site design for this adaptive reuse site along the Genesee River to feature new market rate and affordable townhomes. Passero Associates is redesigning all of the infrastructure and working closely with the City of Rochester to integrate the project with the City's new waterfront park area. Engineering challenges of this project include designing the construction of the new buildings onto the existing foundations. The soil conditions in the area require preserving and maintaining the existing foundation's infrastructure to support the new structure.

**Bayfront Apartments, Greece, New York** — Project Engineer for an innovative approach to design for a 77-unit residential development alongside Long Pond, one of the first projects in the Monroe County area to meet new requirements of the Department of Environmental Conservation for waterfront development. Alternative Better Site Design practices were used by Passero engineers in the project layout and design. These include an organic filtering system that uses vegetation plantings to improve stormwater runoff, which is removed and treated for phosphorus in the filtering system.

**Mildred Johnson Estates, Rochester, New York** — Project Engineer for site design of 23 individual single family homes developed on scattered lots on Maria Street, Thomas Street, and in the Bernard Street Neighborhood. The new homes are designed in keeping with the architectural character of the neighboring homes.

**Memory Care Residence at Cottage Grove; Rochester, NY** — Project Engineer responsible for the design of Memory Care Residence at Cottage Grove, a 48-unit assisted living apartment complex on a 6.6 acre site. Project improvements included new utilities, parking, roadway infrastructure and pedestrian access.

**Cedar Commons Apartment Complex; Greece, NY** — Conducted a comprehensive drainage study on a 360-unit apartment complex located on 20 acres. The study included an assessment of the existing drainage facilities, a hydraulic drainage analysis, an evaluation of several drainage improvement alternatives and a recommended plan and cost estimate.

**Saratoga Crossing; Farmington, NY** — Designed and managed approvals for a 296-unit apartment and townhome complex including rezoning, traffic study, and NYSDEC Phase II design.

**Riverton Parcel "F"; Henrietta, NY** — Designed and managed 104 lot single family home subdivision through construction. Duties included traffic study, ACOE Wetlands Permit, NYSDEC Phase II stormwater design, and contractor and client coordination.

**West Hill Townhomes; Ithaca, NY** — Designed and drafted a 39-unit Townhome project in the City of Ithaca on the West Hill. Project included retaining wall, mass earthwork, sanitary sewer, watermain and stormwater management design.

**Colonial Plaza; Gates, NY** — Drainage design for two retention ponds releasing into an existing storm tunnel. Assisted with phased traffic study of Spencerport and Long Pond Road.

**Vistas at the Links ; Chili, NY** — Conducted traffic study and assisted in design and drafting of a multi-phase, multi-unit subdivision.

**Clayton Heights; Village of Geneseo, NY** — Designed and drafted drainage, sanitary sewer, backflow prevention and watermain for a 24-unit apartment building.

**Thompson Estates; Canandaigua, NY** — Designed and drafted drainage, sanitary sewer and water main for a 24-unit apartment building community center and four unit apartment building.

**Northwoods Subdivision, Clarence, NY** — 150 lot single family subdivision in the Town of Clarence. Project includes traffic studies and development of Environmental Impact Statement (EIS)

**Riverhouse Apartments, Rochester, NY** — 45-unit apartment project in the City of Rochester

**Clay Road Apartments** — 106-unit apartment project in the Town of Henrietta.

JESS SUDOL
*Project Manager/Engineer*

**Greenwood Townhomes at Chili Paul Square** — 110-unit Senior Townhome development in the Town of Chili . Responsibilities included obtaining a cluster 278 Land Use Approval, Wetland Permitting and Traffic Study with subsequent highway improvements.

**Watersong** — Single family subdivision and site of 2010 Rochester Home Builders Homerama.

**Poets Landing** — 72-unit family apartment project in Dryden, NY.

**Conifer Village at West Hill** — 72-unit Senior Living facility in the Town of Ithaca. Responsibilities including overseeing the rezoning of the subject parcel to allow for the senior land use.

**Cambridge Estates** — 45-unit apartment project in Penfield NY

**Webster Golf Tee** — Design of a mixed use residential and commercial development including 50,000 SF of retail and 200 apartment units.

**Moss Creek Apartments** — 48-unit family apartment project in Whitney Point, NY.

**Archer Meadows** — Project Engineer for a 100 lot subdivision in Chili, NY. Responsibilities included Traffic Impact Study, site design and drainage improvements.

**Fairfield Place** — Project Engineer for a 500 Unit mixed use residential development in Parma, NY. Responsible for site design, drainage improvements and Traffic Impact Study.

**The Fairways** — 200-unit townhome and gold course community in Victor, NY.

## Commerical

**Medley Centre Traffic Study; Irondequoit, NY** — Performed a traffic study that reevaluated the entire transportation and street network system in the Medley Centre and Irondequoit (East Ridge Road) area.

**Homewood Suites Inn; Greece, NY** — Provided unique drainage design for a 5-story, 100-guest room hotel. The project included four rain gardens (each the size of a parking stall) which are positioned around the perimeter of the parking lot. Stormwater from the impervious lot drains to one of the rain gardens where they provide the moist environment required for the plantings. They also allow for the runoff to infiltrate the existing soils providing further groundwater recharge. In addition to meeting the current NYSDEC requirements, the gardens also met the landscaping and aesthetic requirements of the franchise agreement for the hotel.

**Target at Medley Centre; Irondequoit, NY** — Design and drafted a 127,000 SF Target at the Medley Centre facility in the Town of Irondequoit. Design work included vortecnic stormwater management practices, site layout, water service with backflow prevention and sanitary sewer design.

**Storage Center of Henrietta; Henrietta, NY** — Designed and drafted a 105,000 SF self storage facility on 14 acres in the Town of Henrietta. Project included site layout, mass earthwork, watermain, sanitary sewer and stormwater management design. Project also included facilitating town, county and state approvals.

**3817 West Henrietta Road; Henrietta, NY** — Designed and drafted storm sewer and retention pond for a 250 plus stall parking lot.

**Hampton Inn, Irondequoit, NY** — Project Manager in charge of coordination amongst disciplines and overseeing site design. Responsibilities include procuring municipal and land use approvals of an 80-unit hotel.

**Red Roof Hotel, City of Rochester** — Project Manager in charge of coordination amongst disciplines and overseeing site design. Responsibilities include procuring municipal and land use approvals.

**Webster Golf Tee** — Project Manager in charge of coordination amongst disciplines and overseeing site design. Responsibilities include procuring municipal and land use approvals.

**Chili PNOD** — 50,000 SF specialty retail development in Chili, NY.

**Garber Automotive** — Used Car Sales office in Henrietta.

**White Lake Mansion** — Historical rebuild and redevelopment of the oldest resort in the Catskills into a resort and health spa.

**Sawgrass Medical** – 70,000 SF medical office development in Brighton, NY.

**Salvation Army Retail Center, Clay, NY** — Redevelopment of Used Car facility into a Slavation Army Retail Store in Clay.

**Creekside Commons** — 12,000 SF specialty retail building in Chili, NY. Responsibilities included facilitating rezoning process and all Land Use Approvals.

**Pittsford Animal Hospital** — 15,000 SF addition in Brighton, NY.

**Calkins Corporate Park** — Class A office Park in Henrietta.

**Mercedes Benz** — New Automotive Dealership in Henrietta.

## Transportation

**Canandaigua Traffic Study; Canandaigua, NY** — Performed traffic analysis to determine the impacts associated with the new Community Living Center and Out Patient Clinic. The analysis including conducting an existing conditions survey, projected impacts of the proposed project and mitigation measures necessary to account for new development.

**Geneva General Hospital, Geneva, NY**— Prepared traffic impact study for expansion of the hospital.

**Peter S. Morton, C.P.G**
**Project Manager**

RAVI ENGINEERING & LAND SURVEYING, P.C.

## EDUCATION

M.S. Geology, University of Massachusetts, Amherst, Massachusetts
B.A. Geology, Amherst College, Amherst, Massachusetts

## PROFESSIONAL REGISTRATION

Certified Professional Geologist
NYS Licensed Asbestos Inspector
USEPA Certified Lead Inspector
RCRA/OSHA 40 hour Hazardous Waste Training

## PROFESSIONAL SOCIETIES

American Institute of Professional Geologists Certificate #7932

## PROFESSIONAL EXPERIENCE

Peter has over 25 years of environmental services experience. He is a Certified Professional Geologist, a NYS Licensed Asbestos Inspector and a USEPA Certified Lead Inspector. He has experience in planning and managing subsurface and surficial environmental investigation. His experience includes Phase I Environmental Site Assessments, Phase II investigations and remedial plans, soil gas surveys, underground storage tank closures, remedial investigations/ feasibility studies (RI/FS), Brownfield Cleanup Investigations and design of bioremedial and soil vapor extraction systems. Peter was also a member of the USEPA Superfund Field Investigation Team, Region 2. He was responsible for investigations of inactive hazardous waste sites including all field activities and technical reports.

**Site Assessment** - Peter has greater than 20 years of experience conducting Phase I Environmental Site Assessments (ESAs), supervising Phase II work and Brownfield Cleanup Program (BCP) remedial investigations. Examples of Phase II work include underground storage tank removal, tank testing, drywell closure, and asbestos abatement.

**Cell Towers** - Peter has performed approximately 300 Phase I and Phase II ESAs for a national cellular telecommunications provider.

**NYSDEC Voluntary Cleanup Agreement (VCA) and Brownfield Cleanup Program (BCP) Projects** -

- VCA at former Fischbach & Moore Electric, 235 Metro Park, Town of Brighton
- BCP at former Speedy's Cleaners on Monroe Avenue, Town of Pittsford
- BCP at 37 Bittner Street, City of Rochester
- BCP at Comfort Inn on Buell Road, Town of Gates

**Project Manager for VCA and BCPs** - All of these projects have involved soil vapor surveys, electromagnetic investigations, and soil/groundwater sampling programs. Remedial measures designed and installed during these NYSDEC-supervised projects include sub-slab vapor mitigation systems, and bioremedial methods of in-situ groundwater treatment.

**Petroleum Remediation**- Peter has designed air sparge, soil venting, and bioremedial systems obtaining spill closure at petroleum-contaminated sites and hazardous waste sites including an historic dry cleaning operation with perchloroethylene contamination.

**Soils Management** - Peter worked with the USEPA, and has hands-on experience with the management and handling of contaminated soils and hazardous wastes, including the implementation of health & safety plans. Mr. Morton has prepared and implemented several Soil Management Plans (SMP) for approval by the Monroe County Department of Health (MCDOH). These projects have included fugitive dust monitoring in conformance with New

York State Department of Health (NYSDOH) protocols. Peter has managed several projects in which contaminated surficial soils have been managed in conformance with an MCDOH-approved SMP, allowing for residential development.

**Blue Cross/Blue Shield Remedial Site Plan** - Peter was the Project Manager for the environmental cleanup in March 1997 of urban lands developed as the new Blue Cross/Blue Shield building in Rochester, NY. Environmental conditions included 22 underground storage tanks, 6 in-ground hydraulic lifts and greater than 4,400 tons of petroleum-contaminated soil. A geo-synthetic barrier/passive venting system was designed to prevent residual contamination beneath South Avenue from migrating into the Blue Cross/Blue Shield building.

**Kentucky Groundwater Investigation** - Peter worked with Kentucky DEP investigating groundwater plume originating at a coal mining equipment tooling facility in Harlan, Kentucky. Interim remedial measure included pumping and treating groundwater by air-stripping.

**EPA Groundwater Study** - Peter was the hydrogeologist for a USEPA investigation around a hazardous waste landfill in Niagara Falls, NY, including installation and sampling of overburden and bedrock monitoring wells.

**Oil Storage Facility** - Peter conducted permeability testing at a major oil-storage facility in New York's southern tier, including design of all aspects of investigation and remediation.

## EDUCATION

B.S. Environmental Science, SUNY Fredonia, NY (2011)

## PROFESSIONAL REGISTRATION

OSHA 40-hour Health and Safety Training for Hazardous Waste Site Activities (2011)
NYS Licensed Radon and Radon Decay Product Measurement Inspector
NYS Department of Labor Licensed Asbestos Inspector CERT # 11-19691

## PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE)
Buffalo Association of Professional Geologists
Air & Waste Management Association

## PROFESSIONAL EXPERIENCE

Ryan is directly responsible for Phase I Environmental Site Investigations and Phase II Environmental Site Assessments: for the development of all environmental projects including site investigation, remediation, and Brownfields cleanup and permitting: and for the development of environmental including all field activities, documentation and technical reporting.

**Site Assessments: New York, Florida, Ohio, and Arkansas:** Ryan has extensive experience conducting and managing Phase I Environmental Site Assessments and has completed several throughout New York, Florida, Ohio and Arkansas. He has a broad range of field experience including the use of a variety of soil, surface water, sediment, and groundwater sampling methods; site surveys; soil vapor surveys; geophysical surveys; and hydrogeological test methods. His site investigation experience includes the management and implementation of investigations of small properties and underground storage tank systems to industrial properties with complex operational histories and environmental settings.

**NYSDEC Voluntary Cleanup Agreement (VCA) and Brownfield Cleanup Program (BCP) Projects for:**

- 37 Bittner Street, Rochester, NY - Soil and groundwater sampling programs
- 1440 Empire Boulevard, Irondequoit, NY - Remedial investigation, remedial action work plan, alternatives analysis, soils management planning
- 2299 Brighton Henrietta Town Line Road, Rochester, NY - Remedial investigation, remedial action work plan, alternatives analysis, soils management planning

His projects have involved soil vapor surveys, electromagnetic investigations, and soil/groundwater sampling programs. Remedial measures designed and installed during these NYSDEC-supervised projects include sub-slab vapor mitigation systems, and bio-remedial methods of in-situ groundwater treatment.

**Soils Management for:**

- Court Street, Utica, NY - Petroleum contaminated soil characterization
- Joseph Avenue, Rochester, NY - Petroleum contaminated soil characterization, Vapor mitigation system
- 59 Lake Street, LeRoy, NY - Soil sampling for acetone characterization
- 291 Jefferson Road, Henrietta, NY - Petroleum contaminated soil characterization, removal, and disposal
- 325 South Main Street, Rochester, NY - Petroleum contaminated soil characterization
- 16 Main Street, Akron, NY - Petroleum contaminated soil characterization

Ryan worked with the USEPA, and has hands-on experience with the management and handling of contaminated soils and hazardous wastes, including the implementation of health & safety plans. Mr. Burke has prepared and implemented Soil Management Plans (SMP) for approval by the Monroe County Department of Health (MCDOH). These projects have included air monitoring in conformance with New York State Department of Health (NYSDOH) protocols. Mr. Burke has managed several projects in which contaminated surficial soils have been managed in conformance with an MCDOH-approved SMP, allowing for residential development. Mr. Burke has experience in material characterization and handling, disposal of contaminated materials, and suppression when disturbing contaminated soils.

# Appendix 4 - Health and Safety Plan

# Remedial Action Work Plan
# Health & Safety Plan

ECL Article 27/Title 14

1440 Empire Boulevard
Town of Penfield, New York

NYSDEC Site #C828135

**Prepared for:**

Upstate Brownfield Partners LLC

**Prepared by:**


**Passero Associates, P.C.**
**100Liberty Pole Way**
**Rochester, NY 14604**


August 30, 2012 P.N.20121461.0003

# Table of Contents

# 1 INTRODUCTION

## 1.1 General

This Health and Safety Plan (HASP) was prepared to address the specific health and safety practices and procedures associated with the Brownfield Cleanup Program (BCP) at 1440 Empire Blvd. in the Town of Penfield. The HASP presents information and procedures, including the assignment of responsibilities, personnel protection requirements, work practices and emergency response procedures for Ravi Engineering and Land Surveying, P.C, who will be conducting field activities. This document is based on an assessment of potential health hazards at the site, using available historical information.

This HASP will be followed in conformance with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations found in 29 CFR 1910.120 and 29 CFR 1926. Contractors will be responsible for wearing hard hats, protective foot wear, and hearing protection in conformance with these OSHA regulations.

All personnel and subcontractors who enter the site during field operations and are involved with remedial activities will be required to comply with this HASP.

| | |
|---|---|
| | **Project Manager:** |
| Name: | Jess D. Sudol, PE |
| Telephone: | Office: (585) 325-1000 |
| | **Site Health & Safety Coordinator**: |
| Name: | Michael O'Dell |
| Telephone: | Office: (585) 436-2701 |

This HASP addresses the requirements set forth in the OSHA regulations contained in 29 CFR Parts 1910 and 1926. Emergency Contacts has been included in Section 7.0 of this HASP, and can be readily detached for use in the event of an emergency requiring site evacuation, medical treatment, etc.

### *1.1.1 Background*

The subject site was historically used as a disposal area for construction and demolition debris (C&D). Contaminants of concern identified in fill soils on the subject site are semivolatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs).

## 1.2 Hazard Evaluation

### *1.2.1 Chemical Hazards*

OSHA states that the HASP should be based on a thorough site characterization and analysis to determine the nature and extent of the actual hazards on a site. The Phase II generated by Passero Associates in 2002 indicated that the contaminants of concern are SVOCs and PCBs.

## 1.3 Responsibilities of Safety Personnel

The following roles have been identified for Passero project personnel:

**Project Manager** - The Project Manager has full responsibility for implementing and executing an effective program of employee protection and accident prevention. He is responsible for ensuring that Passero field personnel and subcontractors are properly trained.

**Site Health and Safety Coordinator/Field Manager** - The Site Health and Safety Coordinator or his/her designee will be responsible for enforcement of this HASP for personnel at the site. Ambient air levels will be monitored with an organic meter (OVM) during all drilling activities.

If unsafe work conditions are identified, the Site Health and Safety Coordinator is authorized to order site personnel to stop work; resolution of all on-site health and safety problems will be coordinated through the Project Manager.

## 1.4 Safe Work Practices

### *1.4.1 General Safety Practices*

Site work will be carried out in conformance with OSHA HAZWOPER regulations.

The recommended general safety practices for working around the drilling subcontractor's equipment (i.e., drill rigs) are as follows:

- The contractors will wear hard hats, protective footwear, and earplugs in conformance with OSHA 1926.
- The contractor's equipment will be inspected prior to use to check for obvious structural damage, loose nuts and bolts, loose or missing guards, cable guides or protective covers, fluid leaks, damaged hoses, cables, pressure gauges or pressure relief valves, and damaged drilling tools and equipment.
- Heavy equipment will not be operated within 20 feet of overhead wires. The site will be clear to ensure the project staff can move around the equipment safely.
- Hard hats and safety boots will be worn in the vicinity of the heavy equipment.
- The contractor will keep the BCP and Borrow Pit area tidy. This will prevent personnel from tripping and will allow the safe and expeditious exit from the site.

### *1.4.2 Respiratory Protection*

Based on our previous Phase II data, level D respiratory protection will be utilized, and will be upgraded as described below.

- During all drilling and sampling activities, ambient air will be screened with an Organic Vapor Meter (OVM). If reading greater than 25 ppm above background level is registered consistently for a five (5) minute period, Level C respiratory protection will be required.

- If readings greater than 50 ppm above background, work will be halted and Health and Safety issues will be re-evaluated.

### *1.4.3 Air Monitoring*

Continuous air monitoring will be performed with the PID during all intrusive activities. Temporary upwind and downwind points will be monitored. Wind direction will be monitored throughout the work day; the locations of the monitoring points will be changed according to the wind direction. Refer to Remedial Action Work Plan (RAWP) Section 11 for Community Air Monitoring Plan (CAMP).

## 1.5 Personal Protection Equipment

### *1.5.1 Protection Levels*

Field work will be performed utilizing Level D protective gear (i.e. field clothes). Surgical gloves will be worn while collecting environmental samples. Contractors will wear hard hats and steel-toed boots, and ear plugs in conformance with OSHA 1926.

## 1.6 Decontamination

A decontamination pad constructed of timber (2 x 4's) and lined with polyethylene sheeting will be constructed prior to construction activities. Equipment will be decontaminated with a mixture of alconox (or similar detergent) and water prior to leaving the site. All equipment will be pressure-washed between sample locations to prevent cross contamination. Rinse water will be collected and drummed to prevent runoff. The decontamination water generated within the decontamination pad will be containerized and characterized for disposal purposes.

## 1.7 Emergency Procedure And Contacts

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

A list of emergency contacts and phone #'s is provided on the following page:

- 911 - emergency situations requiring immediate response from police, fire department, or ambulance.
- (800) 457-7362 - NYSDEC Spill hotline
- (585) 226-226-5308 - NYSDEC Project Manager Mathew Gillette
- (518) 402-7860 – NYSDOH
- (585) 274-6904 – MCDOH
- (800) 424-9300 - Chemtrec (chemical emergencies)
- (404) 633-5313 - Centers for Disease Control (biological agents)
- (800) 424-8802 - National Response Center

- (202) 426-0656 - USDOT Office of Hazardous Operations
- (202) 426-8802 - USDOT Regulatory Matters
- (800) 424-9346 - USEPA RCRA-Superfund Hotline

### *1.7.1 Regulatory Contacts*

NYSDEC Region 8 Project Manager
Mathew Gillette, P.E.
585-226-5308

NYSDOH Project Manager
Melissa Menetti
NYSDOH - BEEI
Flanigan Square - Room 300
547 River Street
Troy, NY 12180-7866

MCDOH Project Manager
Jeffrey M. Kosmala, PE
Monroe County Department of Health
111 Westfall Rd., Room 938
Rochester, NY 14620

### *1.7.2 Personal Injury in the Work Zone*

If an injury occurs in the Work Zone, the affected person will be decontaminated to the extent possible prior to movement. Contact will be made for an ambulance to transport the injured worker to the designed medical facility. No persons shall re-enter the work area until the cause of the injury or symptoms is determined.

If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue. If the injury increases the risk to others, all site personnel shall move to the designated area determined prior to the start of the project. On-site activities will stop until the risk is removed or minimized.

### *1.7.3 Fire/Explosion*

If an on-site fire or explosion occurs, the fire department shall be alerted and all personnel moved to a safe distance from the involved area.

In all situations, when on-site emergency results in the evaluation of the work area, personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been re-assessed.
3. The HASP been reviewed.

4. Site personnel have been briefed on any changed in the HASP.

### *1.7.4 Route to Hospital*

In the event of a medical emergency, the nearest hospital is Rochester General Hospital (RGH). Directions to RGH:

- West on Empire Boulevard to
- North on interstate I-390 to
- West on NYS Rt. 104 to
- Left on Portland Avenue to
- RGH on right

(map attached)