REMEDIAL ACTION WORK PLAN

109-125 MARBLEDALE ROAD
TUCKAHOE, NEW YORK
BROWNFIELD CLEANUP PROGRAM SITE # C360143

Prepared For:

BILWIN DEVELOPMENT AFFILIATES, LLC
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Certification

I William A. Canavan certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Remedial Action Work 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) and that all activities were performed in full accordance with the DER-approved work plan and any DER approved modifications.

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William A. Canavan, PG, LSRP

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Date

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1 Introduction

1.1 Purpose and Scope

Volunteer Bilwin Development Affiliates, LLC plans to remediate the Former Marble Quarry Landfill (Site) (BCP Site number C360143) located at 109-125 Marbledale Road, on the west side of Marbledale Road in the Village of Tuckahoe, Westchester County, New York, and then redevelop the Site into a multi-story hotel, and restaurant with associated parking areas, which Project will serve to cap the former Landfill. The Site has a long history of commercial and industrial operations, first as a quarry until 1958, then as a municipal landfill (until 1978), auto repair and car storage (starting in or about 1989), and most recently for surface parking. Based on the Site history and documented environmental contamination, the Site was admitted into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) on April 30, 2014. The Site location is shown on **Figure 1** and a Site plan showing all sampling locations is included as **Figure 2**.

HydroEnvironmental Solutions, Inc. (HES) and D&K Consulting Engineers PC (D&K) have prepared this Remedial Action Work Plan (RAWP) on behalf of Volunteer Bilwin Development Affiliates, LLC in support of the remediation and redevelopment of the Site. This Work Plan summarizes the findings and recommendations of the Remedial Investigation Report completed for the Site (HES, January 2016), and describes the remedy selection process and recommended remedial alternative for the Site.

1.2 Background

Historically, the Site was used for commercial and industrial operations. Around the turn of the 20th century, the Site was used as a marble quarry. Mining operations ceased sometime around mid-century. In or about 1958, the quarry closed and the new owner entered into a lease agreement with the Village of Tuckahoe to “fill” the former quarry. The bottom of the Landfill still consists of marble rock and therefore likely acts as an impediment to off-site Ardmar Realty Company (later known as Ardmar Realty Co., LLC flow of contaminated landfill groundwater.

In or about 1978, Ardmar Realty Company (later known as Ardmar Realty Co., LLC) purchased the Site, paved it and began using it for auto parking. In or about 1989, the Site was also used by a tenant for auto repair and car storage. An auto sales and service

facility was subsequently established at 125 Marbledale Road, which is surrounded by the central portion of the subject Site. This establishment was never part of the subject Site, and the property is now operating as a commercial gym. Historically, the surrounding area was predominantly industrial and commercial businesses, including several auto service stations.

Site development work completed under the approved BCP will include construction of a multi-story hotel and a restaurant with associated parking areas. The remedial work outlined herein will include soil excavation and removal where necessary to remove hot spots of contamination and as required to prepare the site for the redevelopment, installation of soil vapor barriers and sub slab depressurization systems (SSDS) beneath the proposed buildings designed to draw contaminated vapors back onto the Site and up through these systems in order to mitigate any vapor exposures and cap the former landfill with the proposed development of the Site.

2 Summary of Contamination and Potential Risk

2.1 Summary of Soil Contamination and Potential Risk

2.1.1. Surface Soil

The following summary of contamination and potential risk is reflective of the Remedial Investigation Report (RIR), which was submitted to the NYSDEC on January 15, 2016. The RIR states that the Volunteer intends to remediate the Site to Track 4 (restricted commercial) standards. However, the summary of contamination and potential risks were compared to the NYSDEC's more conservative Unrestricted Use and Restricted Residential Soil Cleanup Objectives (SCOs) for purposes of determining the levels of contamination. It is important to note that no restricted commercial cleanup standards were exceeded and the proposed project is commercial in nature.

Analytical results of surface soil/fill samples collected from locations inside the Site boundaries at depths between 0 and 0.17 feet below grade (ftbg) identified the presence of semi-volatile organic compounds (SVOCs), specifically polycyclic aromatic hydrocarbons (PAHs) and metals at concentrations that exceed the NYSDEC's Unrestricted Use Soil Cleanup Objectives (UUSCOs) (6 NYCRR Part 375-6.8(a), 2006). Analytical data for surface soil samples are shown on summary **Table 1**.

SVOCs detected above UUSCOs include benzo(a)pyrene, benzo(b)fluoranthene, and chrysene. Metal concentrations detected in excess of UUSCOs include, lead, copper and mercury. No volatile organic compounds (VOCs) (with the exception of acetone, which is a common VOC in household products such as nail polish remover) were detected above UUSCOs.
The human health risk evaluation indicated that under the current/future use scenario, where the Site is left vacant and undeveloped, it is possible that trespassers could be exposed to chemicals of potential concern (COPC) in surface soil by dermal contact and incidental ingestion as well as inhalation of particulate COPC adsorbed to surface soil/fill.

Under the future-use scenario where the Site is commercially redeveloped into a hotel and restaurant, the risk evaluation indicated that the potential for construction/utility worker exposure to COPC in surface soil/fill is likely via dermal contact with and incidental ingestion of COPC; and inhalation of volatile and particulate COPC in surface soil/fill during future redevelopment and maintenance of the Site. However, such potential exposure would be limited to the duration of construction/utility work and would be mitigated through the development and implementation of a Site Specific Health and Safety Plan (HASP).

The planned removal of the contaminated soil/fill source material from hot spot areas, building foundation and structural fill footprints and subsurface drainage and buried utility corridors across the Site would remove the contaminants identified in the surface soil discussed above in these areas. A proposed vegetative or engineered cap elsewhere across the Site would prevent access to COPC for Site workers or future patrons.

The planned redevelopment will also mitigate any current potential dust migration of these surface soils that may be occurring and prevent trespasser exposure.

2.1.2. Subsurface Soil

As shown on summary **Table 2**, VOCs, SVOCs, polychlorinated biphenyls (PCBs), and metals were detected at concentrations above UUSCOs in some of the 25 subsurface soil samples collected on-Site.

Seven SVOCs/PAHs were detected above the NYSDEC UUSCOs. VOCs including acetone, benzene, toluene and total xylenes were detected above SCOs at multiple test boring locations as outlined on **Table 2**. The detected SVOCs that exceeded SCOs included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and chrysene.

Analytical soil data from some of the thirteen sample locations identified concentrations of chromium, lead and mercury in excess of UUSCOs. Other metals detected above UUSCOs included copper, zinc and magnesium. **Table 2** shows that the most prevalent metal detected was lead, which was detected above UUSCOs at test boring locations TB-2, TB-4, TB-6, TB-7, TB-10, TB-11 and TB-12, with the highest concentration (589 mg/Kg) observed at TB-4. Mercury was also detected at six different sampling locations with the highest concentration of 0.57 mg/Kg at TB-10.

PCBs were detected at three sampling locations (TB-4, TB-7 and TB-10). The detections ranged in depth from 4-6 ftbg to 32 ftbg (TB-10). As part of the remedial action, the shallow (4-6 ftbg) hot spot areas will be excavated for proper off-site disposal. The observed hot spots at TB-4 (24-26 ftbg) and TB-10 (32-34 ftbg) are too deep to excavate and thus will be left in place, beneath the site wide composite cap. Additionally, hot spots where SVOCs and metals were observed in surface soils and subsurface soils will also be removed for off-site disposal. The hot spot removal is discussed below and those that are proposed to be removed are shown on **Figure 3**.

Under the future scenario where the Site is redeveloped into a hotel and a restaurant, the risk evaluation indicated that the potential for construction/utility worker exposure to COPC in subsurface soil/fill during future redevelopment and maintenance of the Site is likely via dermal contact, incidental ingestion and inhalation of volatile and particulate COPCs. However, such exposure would be limited to the duration of construction/utility work and would be mitigated through the development and implementation of a HASP.

Site remediation design plans include removal of the PCB hot spots and soil/fill in building foundation and structural fill footprints, utility trenches, and subsurface stormwater structures as required. All of the contaminants identified in these subsurface soil/fill areas will be removed and disposed of off-Site at these locations. Some of the excavated soil will be reused as part of the cut and fill plan described in detail below. Confirmatory samples collected from the final construction grade and sidewalls in these areas will be compared to Commercial SCOs. Potential exposure to COPCs in the subsurface soil/fill will be temporary during the construction period until the Site-wide remedial composite cover system is installed consisting of paved parking areas, the new building foundations, concrete sidewalks and an engineered one foot vegetative soil cap. Filter fabric will be used as a demarcation boundary between any “clean” fill soils installed on the site in the landscaped areas and the underlying residual contaminated soils.

2.2 Summary of Soil Vapor Contamination and Potential Risk

Soil vapor samples collected from eighteen (18) on-Site locations detected VOCs associated with petroleum hydrocarbons including benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds) and are pervasive throughout the Site. VOCs associated with solvents and Freon including 1,1,2,2-tetrachloroethane, 1,1-dichloroethene and dichlordiflouromethane were detected at most soil vapor sampling points. As shown on summary **Table 3,** the vapor detections were pervasive across the Site and provisions will need to be incorporated into the proposed buildings to mitigate the potential for vapor migration.

Under the future land-use scenario in which the Site is being redeveloped into a hotel and a restaurant, and with the conservative assumption that no soil or vapor mitigation would take place, Site workers and on-Site patrons could potentially be exposed to VOCs in soil vapor that may migrate into indoor air of future on-Site buildings.

However, the soil vapor inhalation exposure pathway can be readily mitigated for the future commercial land-use scenario by installing vapor barriers and SSDS beneath the proposed buildings.

Construction/utility workers exposure to soil vapors during construction would be limited to the duration of construction/utility work and would be mitigated through the development and implementation of a HASP.

2.3 Summary of Groundwater Contamination and Potential Risk

Groundwater samples collected from nine on-Site monitoring wells contained VOCs, SVOCs, and pesticides above NYSDEC Ambient Water Quality Standards (AWQS). However, based on the depth of groundwater (greater than 18 ftbg) and the proposed development which will not intersect the water table, the Human Health Evaluation supported a determination that groundwater was not an environmental medium of concern.

Human exposure to groundwater and the constituents in the groundwater is unlikely because on-Site groundwater is not used; rather, potable water is provided to the Site and vicinity by the Village of Tuckahoe. Additionally, where groundwater was present, the depth to groundwater ranged from 18 to 34 ftbg. Thus, it is not expected that

construction/utility workers would have direct contact or exposure to groundwater at these depths during future construction or excavation activities.

3 Remedial Action Objectives

The most significant conclusion drawn from the RI is that on-Site soil/fill and soil vapor are the media of concern warranting remedial action. The following medium-specific Remedial Action Objectives (RAOs) were identified to be protective of public health and are based on contaminant-specific standards, criteria, and guidance (SCGs):

Soil: SCOs for the Protection of Public Health - Restricted Commercial (New York Code of Rules and Regulations-NYCRR Subpart 375-6.8(b).

Soil Vapor: October 2006 NYSDOH Soil Vapor Intrusion Guidance Document Matrix Criteria.

The overall objective of the Site remedial actions is to mitigate the potential risks posed by the on-Site soil and soil vapor, to achieve a Site condition that allows for the proposed reuse as a commercial development including a hotel and restaurant. The specific RAOs for the media of concern are:

Soil RAOs include:

- Protect current/future trespassers from potential direct contact with and incidental ingestion and inhalation of COPCs (VOCs, PAHs and metals) in surface soils (0-1 ~~ee~~oot depth) in the absence of Site redevelopment.
- Protect future construction/utility workers and patrons from potential direct contact with and incidental ingestion and inhalation of COPCs (VOCs, PAHs and metals) in surface (0-1 feet) and subsurface (1-16 feet) soils.

Soil Vapor RAOs include:

- Mitigate potential impacts to health of current/future Site workers/patrons resulting from potential inhalation of soil vapor intrusion into future Site buildings. Mitigation measures include limited removal of VOC impacted on-Site soil and control of soil vapor via SSDS and vapor barriers. Potentially affected receptors include: current/future on-Site trespassers and workers, as well as future affected receptors

including on-Site workers and patrons and off-Site residents. These measures should indirectly benefit potential off-site receptors since the on-Site SSDSs may be designed to draw vapors back onto the Site.

The remedial goals for this Site are to eliminate or reduce to the extent practicable, potential exposure of persons at or near the Site to SVOCs, PCBs and metals in soil/fill and VOCs in soil vapor.

4 Remedial Alternatives

Alternative remedies for the Site fall into one general category, restricted use of the Site. However, the Unrestricted Use remedy will also be analyzed even though it is not a realistic option.

The remedies that would result in restricted use of the Site include:

Alternative A. No Action – The No Action alternative assumes that no remedial action is taken and the Site is redeveloped, but without removal of or capping any of the impacted soils.

Alternative B. Partial removal and off-Site disposal of the "Hot Spots" including SVOC and metals and PCB-impacted soils and soils/fill to the required depth to allow for proposed construction and replacement with clean fill or new redevelopment structures, Cover System and Vapor Controls.

- Some soil excavation of hot spots including SVOC and metals and PCB-impacted soils and soils/fill to the required depth to allow for proposed construction and replacement with clean fill or new redevelopment structures.

- A composite cover system consisting of the proposed building foundation footprints, paved parking areas, sidewalks and one foot soil cover in landscaped vegetative areas.

- Active sub slab depressurization systems (SSDS) and vapor barriers beneath proposed structures to mitigate soil vapor from subsurface materials under building footprints.

- Long Term Institutional Controls and Engineering Controls implemented through a Site Management Plan (SMP) and recorded in an Environmental Easement (EE).

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Alternative C. Partial removal and off-Site disposal of impacted on-Site soil/fill to the required depth to allow for proposed construction and replacement with clean fill or new redevelopment structures without Hot Spot Removal, Cover System and Vapor Controls.

- A composite cover system consisting of the proposed building foundation footprints, paved parking areas, sidewalks and one foot soil cover in landscaped vegetative areas.

- Active sub slab depressurization systems (SSDS) and vapor barriers beneath proposed structures to mitigate soil vapor from subsurface materials under building footprints.

- Long Term Institutional Controls and Engineering Controls implemented through a Site Management Plan (SMP) and recorded in an Environmental Easement (EE).

Alternative D. A Track 1~~1~~ Complete Removal of the Landfill Remedy

While this may sound as if it would be the preferred option, the long term and short term impacts, and astronomical costs associated with this option would not justify its impacts and expense. Such a removal action would cause significant short term exposures during excavation that would not justify long term benefits that are still accomplished by the preferred remedy.

Alternative B, the Hot Spot Removal and Engineered Composite Cap remedy along with active SSDS and vapor barrier mitigation measures for on-Site structures is the preferred remedial alternative considered for the Site for the following reasons:

- Surface soils and hot spots can be effectively excavated and removed through methods that would eliminate the potential hazards posed by the contamination during construction.

- The Composite Cover System will cover the entire former landfill with an engineered cap that will be managed by the current and all future owners and operators through a SMP and EE.

- Installation of vapor barriers and an active vapor mitigation systems incorporated into the building foundations will address indoor air vapor concerns.

- Some on-Site soil moved during Site regrading and construction is proposed for on-Site reuse in accordance with DER-10 and the BCP green remediation measures.

The following four remedial alternatives were evaluated for this Site:

A. No Action – The No Action alternative assumes that no remedial action is taken and the Site is redeveloped, but without removal of or capping any of the impacted soils.

B. Track 4 Cleanup with Hot Spot Removal – Under a Track 4 cleanup, some on-Site soils containing constituents of concern, including some locations beneath the proposed buildings, will be removed to accommodate construction, and will either be reused on-Site and capped or properly disposed of at an off-Site facility.

C. Track 4 Cleanup without Hot Spot Removal – under this alternative, no hot spots will be removed. All soil would be reused on-Site during construction.

D. Track 1 Cleanup – Complete removal of the Landfill down to the former quarry bottom.

Each of these four remedial alternatives is described in more detail below.

4.1 Description of Remedial Alternatives

4.1.1. Alternative A - No Action

This alternative assumes that no remedial action is taken. Since SVOCs, PCBs and metals are present in surface and subsurface soils at concentrations that exceed the NYSDEC Unrestricted and Restricted Residential SCOs, this alternative would not be protective of human health and the environment and would not be compliant with 6 NYCRR Subpart 375-6. Moreover, the soil vapor issues would not be addressed on a long term basis and the site would not be managed through an SMP and EE. For these reason, this alternative was not considered further.

4.1.2. Alternative B - Track 4 Cleanup (Hot Spot Removal, Composite Cover System and Vapor Mitigation Measures)

Hot Spot Removal

There are several areas of the landfill that contained contaminants that require hot spot removal. Three PCB areas were identified and several high hot spots of metals and SVOCs

were identified. PCBs exceeded SCOs at test boring locations TB-4, TB-7 at a depth of 4-6 ftbg and at TB-10 at a depth of ~~4-6~~32 ftbg, additionally, SVOC hot spots at test borings TB-2, TB-3, TB-6, and TB-9 through TB-13 will also be removed for off-site disposal. SVOC hot spots in shallow soil at SS-2 and SS-6 through SS-8 will also be removed for off-site disposal. Metals hot spots at TB-2, and TB-6 will also be removed. The location of hot spots that will be removed for off-site disposal are shown on **Figure 3** along with the depth of the hot spot.~~;~~ T~~t~~he soil in the accessible areas ~~is accessible and~~ will be removed for off-Site disposal during construction. Following soil excavation and removal, end-point samples will be collected to confirm that the PCB, SVOC and Metals-impacted soil has been removed. Given the depth of the PCB hot spot at test boring location TB-10 (32 ftbg), it is not practical nor accessible to remove these soils, and they will be left in place beneath the composite cap.

With respect to the SVOC and metals hot spots, the plan would be remove these hot spot areas down to 15 feet (the extent of a backhoe). These areas are outlined above and are shown on **Figure 3**. Following their removal, end-point soil samples will be collected from the bottom and sidewalls of the excavations to confirm that the extent of the hot spot has been properly removed and remaining soils meet applicable Track 2 Restricted Residential SCOs.~~-~~

Cut and Fill Plan

Under this cleanup alternative, on-Site soils would also be removed in areas where subsurface excavation is required including utility trenches, subsurface stormwater drainage and storage structures, and building foundation and structural fill footprints. Some of the material requiring excavation would be relocated on-Site and re-used to regrade the Site. However, a portion of the excavated soils will need to be properly disposed of at an off-Site disposal facility. The soil that remains on-Site for reuse will be placed beneath an engineered cap.

Based on the cut and fill sections for the proposed development, approximately 1,000 cubic yards (yds^3) of soil will need to be imported from an off-Site location. Any material proposed to be imported will be certified clean fill and will be sampled in accordance with DER-10 and the BCP. A total of 5,500 yds^3 are proposed to be cut and reused, and 6,500 yds^3 are proposed to be filled on-Site, thus, the need to import approximately 1,000 yds^3 of fill material. If any new hot spots consisting of grossly contaminated soil based on visual or odor observations are discovered during this Site remediation activity, these soils will be separated into stockpiles and tested for off-site disposal. The breakdown for the proposed Site development is as follows:

Total Property Area = 145,195 ft^2

Building Area (Hotel and restaurant) = 25,242 ft^2

Parking Area = 75,577 ft^2

Paved/Concrete Area (sidewalks, etc.) = 10,994 ft^2

Soil Cap/Landscaped Area = 33,382 ft^2

Based on the proposed future Site development, a cut and fill soil plan was developed. Cross-section locations of the cut and fill plan are shown on **Figure 4** and actual proposed cut and fill cross section details are shown on **Figure 5A** through **6B**. The areas proposed for cut and fill include the subsurface stormwater drainage systems, the building areas, utility trenches for sewer, water and electric and the parking areas. In general, the northern portion of the Site is 15 feet higher in elevation. By leveling the Site from north to south, significant soil removal and off-Site disposal will not be required. Proposed cut and fill areas include the following:

Proposed Building Footprints

Proposed Subsurface Drainage Structures

Proposed Parking Areas

Proposed Utility Trenches

During construction, it is anticipated that unsuitable fill material and debris such as metal and foam and possibly some new soil hot spots will be encountered and will need to be segregated and properly disposed of at an off-Site facility. During all soil disturbance activities a Community Air Monitoring Plan (CAMP) will be adhered to along with the Site-specific HASP.

Engineered Caps

Based on the findings of the RI, the entire Site will be covered with an engineered cap. The cap will consist of three basic types:

1) One Foot Soil Cap in Landscaped Areas

2) Asphalt Cap

3) Concrete Cap

The types of proposed caps and their location on Site are shown on **Figures 7** and **8**. As noted on **Figure 7**, the soil cap located in landscaped areas will consist of 12-inches of clean topsoil underlain by a geotextile membrane and demarcation layer to prevent access to residual contaminated soils by humans and animals. A cross section detail of the proposed soil cap is provided on **Figure 8** and the areas of the Site that will be landscaped and have a soil cap are shown on **Figure 7**. The asphalt cap will consist of 4 inches of asphalt underlain by a 2-inch asphalt binder and 2 inches of gravel. Beneath the gravel layer, a geotextile membrane and demarcation layer will be installed as shown on **Figure 8**. The concrete cap, which is detailed on **Figure 8**, will be installed on all sidewalk and patio areas, and the asphalt cap will be installed on all proposed parking areas. These cap locations are shown on **Figure 7**.

Vapor Barrier and Sub-Slab Depressurization

Based on the results of soil vapor sampling, both proposed buildings will be constructed with a vapor barrier and a SSDS. The SSDS will be designed by a New York State-licensed professional engineer to prevent migration of sub-slab vapors into the buildings. A soil vapor barrier and ventilation system will be designed as a precautionary measure such that the potential for migration of soil vapors beneath and adjacent to the new structures will be mitigated through placement of the vapor barrier and ventilation system designed to divert vapors to the atmosphere and away from occupied spaces. The vapor barrier material will be placed at the interface between the soil/fill material and structural fill for the foundation floors/walls in the new structures. The soil vapor ventilation system will be designed as an active system by the addition of air vacuum pumps. The continued operation and maintenance of the SSDS would be required in the SMP and EE.

Specific details of the soil vapor barrier and ventilation system will be prepared with accompanying drawings and submitted to the Department for review and approval before installation. This will include pilot testing results, soil vapor sampling results from both building footprints, and the SSDS design.

A Site Management Plan (SMP) will be prepared by the Volunteer and submitted to the Department for approval.

The Site Management Plan will include the following components:

- Excavation Work Plan – which would provide specific soil handling, sampling, and safety measures required of the Site owner in the possible event that on-Site soils

are disturbed in the future;

- A SSDS Operation and Maintenance Plan – which would provide for the annual inspection of the SSDS system to confirm it is working properly; and
- An Engineering Controls/Institutional Controls (EC/IC) Certification Form - which the Site owner would be required to complete and sign on a periodic basis to certify that the Site use and Site restrictions remain in place and in accordance with the provisions of the Environmental Easement. -
- An Environmental Easement (EE) is also required - which would detail the restrictions placed on the property and the environmental obligations of the Site owner to continue to implement the SMP and the restrictions on Site use, including but not limited to installation and maintenance of active ~~passive~~ SSDS, installation and maintenance of an engineered cap, and management of on-Site soils if disturbed in the future.

4.2 Alternative Analysis

4.2.1. Introduction

The following sections present a detailed analysis of Alternatives B, C and D with respect to the evaluation criteria outlined in 6 NYCRR Part 375-1.10 and the RAOs for the Site.

4.2.2. Overall Protection of Public Health and the Environment

This threshold assessment addresses whether each remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled. This evaluation allows for consideration of whether the alternative poses any unacceptable short-term or cross-media impacts.

Alternative A – No Remedial Action

This remedial alternative is not considered here as it will not provide protection of human health and the environment and will not achieve RAOs.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

As determined by the risks identified in the Site-specific Qualitative Risk Assessment, the remedy required for this Site needs to remediate surface and subsurface soils to prevent dermal and inhalation exposure and control vapors to prevent inhalation exposure.

Alternative B provides adequate protection of public health and the environment and, therefore, will achieve the RAOs for the Site because through excavation of hot spots the most contaminated areas of soil contamination will be removed, some contaminated surface soil will be removed and through installation of a Site-wide cover system, surface soils will be contained and managed through an SMP. With the installation of an active SSDS coupled with a vapor barrier and managed cover system, potential soil vapor exposure will be mitigated and indoor on-Site occupants protected.

With respect to the protection of workers, an Excavation Work Plan and Site-specific HASP will provide guidelines and protocols for protecting on-Site workers, the public, and the environment during Site redevelopment actions that would disturb the soil/fill material. The Excavation Work Plan also requires the off-Site disposal of soil/fill material determined to contain contaminant concentrations above UUSCOs when encountered if they cannot be reused on-Site.

Alternative C – Composite Cover System and Soil Vapor Controls

Alternative C provides some protection of public health and the environment but leaves the most contaminated hot spot areas of contamination on Site under the cover system. Since a Track 4 remediation requires removal of hot spots, therefore, this remedy will n o t achieve the RAOs for the Site because hot spots of the most contaminated areas of soil contamination will not be removed. However, some contaminated surface soil will be removed and through installation of a Site-wide cover system, surface soils will be contained and managed through an SMP. With the installation of an active SSDS coupled with a vapor barrier and managed cover system, potential soil vapor exposure will be mitigated and indoor on-Site occupants protected.

With respect to the protection of workers, an Excavation Work Plan and Site-specific HASP will provide guidelines and protocols for protecting on-Site workers, the public, and the environment during Site redevelopment actions that would disturb the soil/fill material. The Excavation Work Plan also requires the off-Site disposal of soil/fill material determined to contain contaminant concentrations above UUSCOs when encountered if they cannot be reused on-Site.

Alternative D – Track 1 Complete Landfill Removal

Alternative D may provide the greatest long term protection through elimination of all landfill content however, the short term impacts, including severe odors and vapors from the removal of all the contaminated material and truck traffic for more than a 2 year timeframe would actually cause more environmental impacts than leaving the landfill in place. The standard protocol for landfills is to cap them in place. Complete landfill removal is also not required for a commercial project on this Site since the commercial SCOs are not exceeded.

4.2.3. Compliance with Standards, Criteria, and Guidance (SCGs)

A Site's remedial program must be designed to conform to standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable, or that are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with [6 NYCRR 375-1.0(c)(1)(i)].

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

While there are no exceedances of the soil commercial SCOs detected during the RI in relation to the planned commercial project, there are still exceedances of both the unrestricted and restricted residential SCOs. Remedial Alternative B would fully comply with SCGs for the Site by capping the contaminated soil/fill and controlling vapors to avoid dermal contact with soils exceeding unrestricted and restricted residential levels and soil vapors exceeding the applicable NYSDOH or USEPA guidance levels for indoor air.

Alternative C – Composite Cover System and Soil Vapor Controls

While there were no exceedances of the soil commercial SCOs, however, there were hot spot PCB, SVOC and metals areas that would not be removed with this remedy compared to Alternative B, which is more protective. Nevertheless, Remedial Alternative C would fully comply with SCGs for the Site by capping the contaminated soil/fill and controlling vapors to avoid dermal contact with soils exceeding unrestricted and restricted residential levels and soil vapors exceeding the applicable NYSDOH or USEPA guidance levels.

Alternative D - – Track 1 Complete Landfill Removal

The commercial SCOs have not been exceeded on the Site. Therefore, the SCGs have been met and the complete removal of the landfill is unnecessary given that the preferred remedy will address surface soil and vapor exposures.

4.2.4. Long-Term Effectiveness and Permanence

This criterion evaluates the long-term protection of human health and the environment at the completion of the remedial action. Effectiveness is assessed with respect to the magnitude of residual risks; adequacy of controls, if any, in managing treatment residuals or untreated wastes that remain at the Site; reliability of controls against possible failure; and potential to provide continued protection.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

Remedial Alternative B would effectively reduce the long-term risk to public health and the environment by removing the most contaminated hot spots and capping the impacted soil/fill that poses the potential risk. Any Soil/fill imported to the Site after remediation will be clean soil. Contaminated soil will be completely covered with the Site-wide cap. Additionally, the proposed SSDSs and vapor barrier will prevent vapors from entering either of the proposed on-Site buildings. These engineering controls will be required to be maintained in perpetuity over the long term through the implementation of the SMP and EE by all future owners and operators.

Therefore, Alternative B will provide long-term effectiveness and permanence in achieving the RAOs for the Site.

Alternative C – Composite Cover System and Soil Vapor Controls

While the Alternative C capping only remedy would also be protective over the long term, the most contaminated areas on the Site would remain in place and may require future long term maintenance. Therefore, Alternative B is preferred over Alternative C. These engineering controls will be required to be maintained in perpetuity over the long term through the implementation of the SMP and EE by all future owners and operators.

Alternative D – Track 1 Complete Landfill Removal

Alternative D may provide the greatest long term protection through elimination of all landfill content and thus achievement of a Track 1 remedy, however, the short term

impacts described below would be so onerous and noxious, including severe odors and vapors from the removal of all the contaminated material (i.e. 94,000 cubic yards of material) and truck traffic for more than two year timeframe, that this remedy would actually cause more environmental impacts than leaving the landfill in place. The standard remedial protocol for landfills is to properly cap them in place. Complete landfill removal is also not required for a commercial project on this Site since the commercial SCOs are not exceeded.

4.2.5. Reduction of Toxicity, Mobility, or Volume

This evaluation criterion addresses the preference for selecting a remedial action alternative that permanently and significantly reduces the toxicity and/or mobility of the detected contaminants. This criterion is satisfied when the remedial action is used to reduce the principal threats at a Site through capping of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media if soil is removed.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

This Site essentially consists of an uncapped landfill. Therefore, contaminated soils on the surface of the site can migrate (i.e. can become mobile), trespassers can be exposed to these soils and vapors are currently unaddressed. . Remedial Alternative B will eliminate the mobility of dust, prevent trespassers from being dermally exposed, thus reducing toxicity and the planned vapor mitigation measures will control vapors, and thus reduce toxicity. Complete removal as described in Alternative D has more impacts than environmental benefits and treatment-focused remedial alternatives (e.g., excavation, destruction, separation/treatment and solidification/chemical fixation) are infeasible in a ~~3~~20-~~40~~90 foot deep landfill.

Remedial Alternative B effectively isolates, and thus stops mobility of the contaminants of concern (i.e. elevated SVOCs, PCBs and metals), thus reducing the hazard of constituents present at the Site. This alternative will control existing concentrations of contaminants of concern by complete coverage of the Site by buildings, and an engineered cap including vapor controls, which further reduce toxicity.

Alternative C – Composite Cover System and Soil Vapor Controls

While the Alternative C capping only remedy with vapor controls would also reduce mobility and toxicity, the most contaminated areas on the site would remain in place. By eliminating these hot spots, the Site remedy is more protective over the long term and easier to maintain. Therefore, Alternative B is preferred over Alternative C under this criterion.

Alternative D – Track 1 Complete Landfill Removal

Alternative D may provide the most toxicity and mobility reduction potential through elimination of all landfill content, however, the short term toxic exposure impacts described below that would be so onerous and noxious, this remedy is not feasible. In addition, this remedy is far too expensive for any one party to implement and is unnecessary for the protection of human health and the environment.

4.2.6. Short-Term Effectiveness

The effectiveness of alternatives in protecting human health and the environment during construction and implementation of the remedial action is evaluated under this criterion. Short-term effectiveness is assessed by protection of the community, protection of workers, environmental impacts, during the timeframe the remedy is implemented to achieve the remedial goals.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

Under Alternative B there will be minimal short-term impacts to the community and workers since most contaminated material will remain on-Site but will be properly managed in place through implementation of a CAMP and HASP. Off-site disposal of soil will be handled thrught the ~~Soil Management~~Site Excavation Plan described in **Section 5.3** of this RAWP. Direct loading of trucks will occur on the Site. Standard industrial construction safety practices will be implemented to control dust and odors as described in the Dust and Odor control plans in **Section 10** of this RAWP.

The Excavation/Construction Work Plan will further help to protect on-Site workers, the public, and the environment during Site redevelopment activities. During redevelopment activities, workers engaged in subsurface construction or maintenance activities will be required to implement a Site-specific, activity-specific HASP. In the short-term, the impact to human health and the environment during implementation of the alternative considered will be negligible, will achieve the RAOs, and is anticipated to be completed in approximately six to eight months.

This Alternative would create more short term impacts than the Alternative C remedy since additional excavation of hot spot contaminated soils/fill will occur. However, this additional short term impact is outweighed by the long term benefits of having a cleaner site.

Alternative C – Composite Cover System and Soil Vapor Controls

The Alternative C capping only remedy with vapor controls would create the fewest short term impacts because there would be less execavation. However, areas where the most contaminated material is present would remain on Site. Therefore, the environmental benefits associated with the additional short term impacts from hot spot removal is outweighed by these impacts. ThereforeConsequently, Alternative B is still preferred over Alternative C even under this criterion which has fewer short term impacts.

Alternative D – Track 1 Complete Landfill Removal

Alternative D has the most significant short term impacts. Approximately 94,000 cubic yards (132,000 tons) of contaminated material is present in the former quarry, which would have to be removed in nearly 4,000 truck trips over a period of 2 years at thea cost of nearly $8,000,000 in disposal costs assuming that the soil to be removed can be disposed of for $60 per ton. More than likely, a significant percentage of the soil will cost more than $60 per ton depending on contaminants present and type of waste present in the soil. It should also be noted that the cost of clean backfill, assuming a per ton cost of $40 per ton would be $5,280,000. These costs do not include equipment and labor, project management, and environmental and engineering oversight costs which could be in excess of $500,000. This remedial alternative would create unacceptable traffic on this street and would likely create such significant odors as to make occupancy of the nearby properties uninhabitable. The overall cost of the off-Site disposal and on-Site clean fill import would be so high (i.e. nearly $14,000,000 million) to make this remedy both technically and economically infeasible because these short term impacts would not justify the long term benefits. The neighborhood would be dispelaced in the process of trying to eliminate the landfill. The volume and cost estimation for this remedial alternative are included in **Appendix 1**.

4.2.7. Implementability

A feasible remedy is one that is capable of being successfully carried out with available technology, and can be readily implemented given Site conditions.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

Remedial Alternative B is readily implementable because materials, equipment and the proper remedial protocols and plan to removed some contaminated soil hot spots and surface material, regrade other soil and then install a Site-wide cover system are readily available and will be implemented pursuant to the various plans (Excavation/Construction Plan, CAMP and HASP) to keep on-Site workers and the community safe during all Site

remediation activities. The excavated areas will be replaced by new Site structures or limited volumes of documented clean soil per DER-10 Appendix 5. The Site will be covered completely with new buildings and an engineered cap consisting of asphalt, concrete, or one foot of clean soil and vegetation over a geotextile ~~filter~~ fabric demarcation boundary layer.

Alternative C – Composite Cover System and Soil Vapor Controls

The Alternative C capping only remedy with vapor controls would be even more readily implementable than Alternative B. However, areas where the most contaminated material is present would remain on Site. Therefore, the environmental benefits associated with the additional short term impacts from hot spot removal is outweighed by these impacts. Therefore, Alternative B is still preferred over Alternative C even under this criterion because Alternative B can still be readily implemented.

Alternative D – Track 1 Complete Landfill Removal

Alternative D is not readily implementable. Complete removal of a landfill in a densely developed area is not feasible due to the short term impacts of such a remedy. The costs of this remedial alternative render it an impractical approach. Removal of landfill soil and debris may not be feasible as approval for off-site disposal for this material will be difficult to obtain, if attainable at all.

4.2.8. Community Acceptance

This criterion evaluates whether the community will be accepting of the preferred remedy.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

Multiple public hearings have been held to describe the contamination on the Site. There are a number of members in this community who have a personal history with the landfill and believe it is more toxic than actual sampling has shown~~ing~~ it to be. In fact, multiple samples have revealed that the landfill contaminants do not exceed the commercial ~~sil~~ cleanup levels. Therefore, this Site is perfectly acceptable for the planned commercial use. The Volunteer and its technical and legal team contend that the vast majority of members in the community and the Town officials have reached an understanding that landfills are not excavated because the environmental impacts that would occur during the process of

excavation would be far greater than containing the landfill in place. In the Brownfield Cleanup Program, the Volunteer, and then all future owners, have a legally binding obligation, which runs with the land, to continue to maintain the remedy and controls that have been put in place to manage the former landfill under the redevelopment.

Therefore, the Volunteer and its team contend the vast majority of the community will accept the preferred Alternative B remedy. Redevelopment of this Site will enhance the surrounding neighborhood and the Village of Tuckahoe as a whole. These redevelopment efforts will create positive economic benefits for the Village of Tuckahoe. The project is in the process of going through a completely open and transparent local approvals process. Therefore, the public has had and will continue to have the opportunity to comment on the preferred remedy. This preferred remedial alternative will cap and remove the primary environmental contamination threat and, therefore, risks from the Site to the community. An alternative which sufficiently removes and caps the contamination of concern at the property and returns the Site to productive and neighborhood-friendly use should readily meet this community acceptance criterion.

Alternative C – Composite Cover System and Soil Vapor Controls

The Alternative C capping only remedy with vapor controls will likely be less acceptable to the Community than Alternative B because the most contaminated material present would remain on Site. Therefore, the environmental benefits associated with the additional short term impacts from hot spot removal is outweighed by these impacts. Therefore, Alternative B is still preferred over Alternative C under this criterion because Alternative B is likely to be more acceptable to the community.

Alternative D – Track 1 Complete Landfill Removal

While some members in the community would like the landfill to disappear, once the short term impacts of complete landfill removal are understood, it is likely the community will understand that complete removal of a landfill in a densely populated area is not readily implementable, cost prohibitive, and therefore impossible to occur, and will cause significant short term negative environmental impacts including extensive truck traffic, noxious odors, uncontrolled vapor exposure and property devaluation and displacement.

4.2.9. Cost

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

Remedial Alternative B is estimated to cost approximately $2,400,000.00, see **Table 4**. The

costs outlined on **Table 4** include hot spot removal, limited soil excavation and removal, clean fill importation, Site wide-cutting and filling, design and installation of a Site-wide engineered cap and design and installation of the required SSDS systems and vapor barriers.

Alternative C – Composite Cover System and Soil Vapor Controls

The Alternative C capping only remedy with vapor controls will cost less since the hot spot removal effort would not occur, which totals approximately $450,000.00 out of the $2,400,000.00 total remedial cost for Alternative B described above. However, as noted throughout this Alternatives Analysis, the benefits of Alternative B outweigh the extra cost.

Alternative D – Track 1 Complete Landfill Removal

Alternative D is so cost prohibitive as to be infeasible. Alternative D would cost $8,000,000 for off-Site disposal of 94,000 cubic yards of material and $5,280,000 for importation of clean soil, plus the additional $500,000 for equipment and labor and environmental and engineering oversight.

The environmental benefits of implementing this remedy do not outweigh the costs.

4.2.10. Land Use

Land Use is the last criterion in the Alternatives Analysis. This Site is in a commercially redeveloped area with residential homes on one site only of the Site. The Site is already zoned for a commercial use. Therefore, the planned commercial use is appropriate for the Site.

Alternative B – Hot Spot Removal, Composite Cover System and Soil Vapor Controls

Since the Alternative B remedy is supportive of a commercial reuse, and the commercial use SOCs are not exceeded, the planned commercial use is appropriate for this Site.

Alternative C – Composite Cover System and Soil Vapor Controls

The Alternative C capping only remedy with vapor controls is also supportive of the

planned commercial land use, however, is less environmentally proactive than Alternative B. Therefore, Alternative B is still the preferred remedy.

Alternative D – Track 1 Complete Landfill Removal

Alternative D is not supportive of the zoned and planned land use. A Track 1 remediation is only required for a planned unrestricted use. Not only is this Site not currently zoned for an unrestricted use, but unrestricted use ~~a use~~ is not appropriate for this Site. Therefore, this remedy is not consistent with the zoned land use at this Site.

4.3 Recommended Remedial Alternative

The remedial alternatives analysis was completed by evaluation of all ten required criterion and Alternative B was deemed the preferred remedy.

Based on the known levels of contamination at the Site, as determined from RI data and ~~a~~ qualitative assessment of potential risks to the public health posed by Site contamination, which do not exceed the commercial SCOs in 6 NYCRR Part 375-6.8(b) and the planned and zoned commercial use, the planned commercial remediation and redevelopment of the Site is the preferred remedy and reuse alternative. It was determined that the primary concern at this Site is direct contact, inhalation, and ingestion of SVOCs and metals in surface and subsurface soils, and inhalation of VOCs from soil vapor migrating into indoor air. The Alternative B Hot Spot Removal, Site-wide Cover System and vapor controls track 4~~1~~ commercial remedy would sufficiently mitigate this potential risk to current trespassers and current/future Site workers and occupants at the Former Marble Quarry Landfill Site. Therefore, the Remedial Alternative B Track 4 cleanup, a restricted commercial use, is recommended for the Site. This remedial option is recommended for the Site because it would meet the RAO, is protective of public health, is achievable, affordable, and would meet the needs of the community.

Once the Site is redeveloped, consequential contact with the soil/fill will be addressed by the long term maintenance obligations contained in the SMP and EE. The Site will be used for commercial use and will remain commercial as dictated by the EE and likely Village zoning. Potential future excavation of soil/fill will be managed with the Excavation Work Plan (**Section 5.3**).

4.4 Health and Safety

Invasive work performed at the Site will be completed in accordance with applicable local, state, and federal regulations to protect worker and public health and safety, in addition to the Site-Specific HASP. Contractors performing redevelopment or maintenance activities involving intrusive work ~~intrusive work~~ at the Site are required to prepare a Site-specific, activity-specific HASP that will include a CAMP. Data summary tables ~~summary tables~~ provided in Section 2 of this report should be used by the contractor to facilitate the creation of an appropriate HASP.

4.4.1. Notification

At least 15 days prior to the start of remedial excavation activity, the Site owner or their representative will notify the Department. Currently, this notification will be made to:

Mr. Randy Witcher, NYSDEC
Regional Hazardous Waste Remediation Engineer
New York State Department of Environmental Conservation
Remedial Bureau B
625 Broadway
Albany, New York 12233-7016

This notification will include:

- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

5 Soil Handling Protocol

5.1 Soil Screening Methods

Although soil will be analytically pre-characterized before excavation, soil will be screened in accordance with the Standard Operating Procedure presenting in Section 18.

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

contamination). Soil screening will include all excavation and invasive work performed during development, such as excavations for foundations and utility work.

The soil/fill removed during excavation will be inspected for staining and will be field screened for the presence of volatile organic compounds (VOCs) with a photo ionization detector (PID).

Excavated soil/fill that is visibly stained or produces elevated PID readings (i.e.: sustained 10 ppm or greater) will be considered potentially contaminated soil/fill. Potentially contaminated soil/fill will be stockpiled on polyethylene sheeting and then re-sampled for on-site re-use or disposal.

Sampling and analysis of soil/fill exhibiting staining and/or elevated PID measurements will be completed in accordance with the protocols delineated in this Excavation Work Plan (EWP). Sampling and analysis will also be completed in accordance with the requirements of the disposal facility at which the soil/fill with concentrations of contaminants above the soil cleanup objectives (SCOs) for unrestricted use (per NYCRR subpart 375-6.8(a)) will be disposed.

All excavated and stockpiled soil/fill with evidence of contamination will be sampled and classified for reuse and disposal. Initially, one composite soil sample, and one duplicate sample will be collected, in the manner described in the Standard Operating Procedures (SOPs) included in Section 18 and Quality Assurance / Quality Control Procedures included in Section 19, from five locations within each stockpile. PID measurements will be recorded for each of the five composite sample locations, and one grab sample and one duplicate will be collected from the location with the highest PID measurement of the five composite locations. The composite sample will be analyzed by a NYSDOH ELAP-certified analytical laboratory for Target Compound List (TCL), semi-volatile organic compounds (SVOCs), and TAL metals. The grab sample will be analyzed for TCL volatile organic compounds (VOCs). At a minimum, the duplicate sample will be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for the particular analytes that were detected at concentrations exceeding the unrestricted SCO. The duplicate sample may also be analyzed for RCRA Characteristics including reactivity, corrosivity, and ignitability.

Excavated soil/fill that exhibits no evidence of contamination (staining or elevated PID

measurements) will already have been pre-characterized and will not require additional characterization.

If the analysis of the soil/fill samples reveal unacceptably high levels of any analyte (i.e., greater than one or more SCOs), additional analyses may be necessary to further classify the material for hazardous characteristics for disposal purposes.

5.2 Stockpile Methods

Stockpiling of soil is not anticipated as current plans are to direct load during excavation. However, stockpiling will be allowed under the following conditions if necessary. Stockpile on-site soil/fill with no evidence of contamination (no staining or elevated PID measurements) may take place in approved areas in approximately 50 cubic yard piles, until removed or required for backfill. If stockpiling is to take place, place, grade and shape stockpiles for proper drainage. Locate and retain soil materials away from edge of excavations and dispose of excess soil material and waste materials appropriately.

Stockpile on-site soil/fill with evidence of contamination (staining and/or elevated PID measurements) in approved areas in approximately 50 cubic yard piles, until sample analysis is completed. Place, grade and shape stockpiles for proper drainage. Ensure effective weather proofing of potentially contaminated soil stockpiles. Locate and retain soil materials away from edge of excavations.

Stockpiles will be kept covered at all times with appropriately anchored polyethylene sheeting or tarps.

Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced. The stockpiled soil/fill will be placed on top of and be completely covered using polyethylene sheeting with a minimum thickness of 8-mil to reduce the infiltration of precipitation and the entrainment of dust. The stockpile area shall be protected from stormwater runoff. Edges of the sheeting shall overlap a minimum of two feet and duct tape shall be applied along all seams to prevent movement of sheeting and infiltration of precipitation into the stockpiled soil. Non-soil weights (e.g. tires) may be necessary to inhibit movement of the cover sheeting by wind.

Soil stockpiles will be continuously encircled with a berm and/or silt fence. The berm wall shall be constructed around the stockpile using uncontaminated material covered with the same sheeting as the stockpiled material. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

5.3 Materials Excavation And Load Out

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material. The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

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

The excavation shall be completed in accordance with the following measures:

- Employ a temporary transport vehicle pad for vehicle loading operations to control and contain contaminated soil and debris spillage.

- Excavations for structures and utilities shall be open excavations. Provide excavation protection system(s) required by ordinances, codes, law and regulations to prevent injury to workmen and to prevent damage to new and existing structures or pipelines. Unless shown or specified otherwise, protection system(s) shall be utilized under the following conditions.

    - Excavation Less Than 5 Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.

- Excavations More Than 5 Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded or shored and braced.

- All excavations or disturbances must be covered using appropriate cover material within 10 working days of backfilling or as otherwise approved by the NYSDEC.

- Utility Trench Preparation:
  - No more than 200 feet of trench may be opened in advance of utility laying. Trench width shall be minimized to greatest extent practical but shall conform to the following: Sufficient to provide room for installing, jointing and inspecting utilities. Enlargements at pipe joints may be made if required. Sufficient for shoring and bracing, or shielding and dewatering. Sufficient to allow thorough compaction of backfill adjacent to bottom half of utility. Do not use excavating equipment that requires the trench to be excavated to excessive width or depth.

- Conduct all loading and transportation activities in accordance with all applicable federal, state, and local regulations, including but not limited to United States Department of Transportation and USEPA regulations 40 CFR 172-179.

- Notify the NYSDEC in writing when loading of contaminated soil/fill will occur and include the name and location of the disposal facility to be used. Submit to the NYSDEC, if requested, a full description of the disposal facility, licenses, permits, and compliance status.

- Do not load and transport contaminated soil and debris until receipt of approval from the disposal facility in which the contaminated soil and debris will be disposed.

- Conduct all loading activities to minimize the formation of dust. Contaminated soil and debris transport containers shall be covered to prevent release of dust and particulates and exposure of the contaminated soil and debris to precipitation.

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

- Inspect and clean loaded transport vehicle tires and undercarriage to remove any adhering contaminated soil and debris prior to vehicle departure from the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, secured, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements). Any liner that cannot be decontaminated shall be disposed of with the contaminated soil and debris. Trucks used for transportation of contaminated soil and debris shall travel on authorized roads in accordance with all federal, state and local regulations. Contaminated soil and debris shall be transported for disposal in containers that are watertight. Leaking containers shall be unloaded at the Site and any leaked liquids cleaned up as spills.

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

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

5.4 Materials Transport Off-Site

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

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

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected

and disposed of off-site in an appropriate manner.

Planned truck transport routes are as follows: Trucks coming from Interstate Route 87 will approach the Site from the north at the intersection of Tuckahoe Road and Interstate 87. Trucks will then proceed east on Tuckahoe Road and Main Street until the intersection of Main Street and Marbledale Road. While heading in the northerly direction on Marbledale Avenue, trucks will enter the Site at a southern driveway, drive north in front of the work site, turn west at the northern Site boundary, then head south then east, exiting the Site at the same point as they entered, and then head south away from the Site, see **Figure 9**. All trucks loaded with site materials will exit the vicinity of the Site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

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

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

Prepare a waste transportation and disposal manifest, and all other documents required for waste shipment, for each load of waste material that is transported from the Site. Maintain a waste disposal log on-site containing pertinent waste disposal information. If requested, the NYSDEC on-site representative may review the log.

5.5 Materials Disposal Off-Site

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

Off-site disposal locations for excavated soils will be identified in the pre- excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Final Engineering Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

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

Soil/Fill with concentrations of contaminants above the SCOs will be disposed off-site within 90 days of excavation at an appropriate, permitted disposal facility.

If the analytical results indicate that concentrations exceed the standards for either TCLP or RCRA Characteristic analysis, the material will be considered a hazardous waste and must be properly disposed of off-site at a permitted disposal facility within 90 days of excavation. Additional characterization sampling for off-site disposal may be required by the disposal facility. There is a potential to characterize each stockpile individually to reduce off-site disposal requirements/costs.

5.6 Materials Reuse On-Site

On-Site reuse of excavated materials is anticipated. As per the proposed cut and fill plan, extensive re-use of on-site excavated soil is anticipated. All on-site soil re-use will be conducted in accordance with the above outlined cut and fill plan and will be overlain by the proposed composite site wide cap.

6 Fluids Management

All liquids to be removed from the Site, including excavation dewatering (which will not likely be required) will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering fluids will not be recharged back to the land surface or subsurface of the Site, if they show signs of contaminant impacts. If fluids are deemed impacted, they will be managed off-site.

Pumping of water from excavations, if necessary, shall be done in such a manner to prevent the carrying away of particulates, soil/fill, or unsolidified concrete materials, and to prevent damage to the existing subgrade.

Water from the excavations will be disposed properly in accordance with all applicable regulations in such a manner as not to endanger public health, property, or any portion of the work under construction or completed.

Based on the groundwater analytical results, water in the excavations may be discharged to the ground surface unless staining or elevated PID measurements are observed in the excavation, a sheen is present on the water surface or if pH is less than 6.5 or greater than 8.5. If any of these conditions exist, the water pumped from the excavations will be containerized or may be discharged to the local Sewer Authority under a discharge permit if the water quality falls within the conditions of the permit. If the water quality is such that the permit requirements will be exceeded, the groundwater removed from the excavation will be containerized and sampled. Containerized water not meeting the Surface Water and Groundwater Quality Standards set forth in 6 NYCRR Part 703.5 will be transported off-site for proper disposal.

7 Backfill From Off-Site Sources

All materials proposed for import onto the Site will be approved by the qualified environmental professional and will be in compliance with provisions in this EWP prior to receipt at the Site.

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

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet "exempt" fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

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

Off-site borrow soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products. Off-site borrow soils intended for use as Site backfill cannot otherwise be defined as a solid waste in accordance with 6NYCRR Part 360-1.2(a).

If the contractor designates a source as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use. Virgin soils should be subject to collection of one representative composite sample per source. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver plus cyanide. The soil will be acceptable for use as backfill provided that all parameters meet the Allowable Constituent Levels for Imported Fill or Soil, provided as Appendix 5 of DER-10 (May 2010).

Non-virgin soils will be tested via collection of a combination of grab samples for VOC analysis and composite samples for analysis of SVOCs, PCBs, Pesticides, and Metals as specified in DER-10 subdivision 5.4(e)10. **Tables A-1** and **A-2** provides the sample frequency by volume and analyses to be performed for non-virgin soils prior to use on Site, and the allowable concentration of constituents of concern for imported soil. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, provided all earlier samples met the Allowable Constituent Levels for Imported Fill or Soil, provided as Appendix 5 of DER-10 (May 2010).

Table A-1
Sample Frequency and Analysis for Non-Virgin Imported Soil/Fill Characterization
109 Marbledale Road

	VOCs [1]	SVOCs, PCBs/Pesticides & Metals [1]	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill will comprise a composite sample for analysis.
50-100	2	1	
100-200	3	1	
200-300	4	1	

300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
>1000	Add an additional 2 VOC and 1 composite for each additional 1000 cubic yards or consult with DER.		

Tuckahoe, New York

[1] Specific analyte lists provided in DER -10 Appendix 5

Table A-2
Allowable Constituent Levels for Imported Soil/Fill
109 Marbledale Road
Tuckahoe, New York

Contaminant	Unrestricted Use Allowable Maximum Concentration
Metals	
Arsenic	13
Barium	350
Beryllium	7.2
Cadmium	2.5
Chromium, Hexavalent [1]	1 [3]
Chromium, Trivalent [1]	30
Copper	50
Cyanide	27
Lead	63
Manganese	1600
Mercury (total)	0.18
Nickel	30
Selenium	3.9
Silver	2
Zinc	109
PCBs/Pesticides	
2,4,5-TP Acid (Silvex)	3.8
4,4'-DDE	0.0033 [3]
4,4'- DDT	0.0033 [3]

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4,4'- DDD	0.0033 [3]
Aldrin	0.005
Alpha-BHC	0.02
Beta-BHC	0.036
Chlordane (alpha)	0.094
Delta BHC	0.04
Dibenzofuran	7
Dieldrin	0.005
Endosulfan I	2.4 [2]
Endosulfan II	2.4 [2]
Endosulfan Sulfate	2.4 [2]
Endrin	0.014
Heptachlor	0.042
Contaminant	**Unrestricted Use Allowable Maximum Concentration**
Lindane	0.1
Total Polychlorinated biphenyls	0.1
Semivolatiles	
Acenaphthene	20
Acenapthylene	100
Anthracene	100
Benz(a)anthracene	1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	1
Benzo(g,h,i)perylene	100
Benzo(k)fluoranthene	0.8
Chrysene	1
Dibenz(a,h)anthracene	0.33 [3]
Fluoranthene	100
Fluorene	30
Indeno(1,2,3-cd)pyrene	0.5
m-Cresol	0.33 [3]
Naphthalene	12
o-Cresol	0.33 [3]
p-Cresol	0.33
Pentachlorophenol	0.8 [3]
Phenanthrene	100
Phenol	0.33 [3]
Pyrene	100
Volatiles	
1,1,1-Trichloroethane	0.68

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Contaminant	Unrestricted Use Allowable Maximum Concentration
1,1-Dichloroethane	0.27
1,1-Dichloroethene	0.33
1,2-Dichlorobenzene	1.1
1,2-Dichloroethane	0.02
cis-1,2-Dichloroethene	0.25
trans-1,2-Dichloroethene	0.19
1,3-Dichlorobenzene	2.4
1,4-Dichlorobenzene	1.8
1,4-Dioxane	0.1 [3]
Acetone	0.05
Benzene	0.06
Butylbenzene	12
Carbon tetrachloride	0.76
Chlorobenzene	1.1
Chloroform	0.37
Ethylbenzene	1
Hexachlorobenzene	0.33 [3]
Methyl ethyl ketone	0.12
Methyl tert-butyl ether	0.93
Methylene chloride	0.05
n-Propylbenzene	3.9
sec-Butylbenzene	11
tert-Butylbenzene	5.9
Tetrachloroethene	1.3
Toluene	0.7
Trichloroethene	0.47
1,2,4-Trimethylbenzene	3.6
1,3,5- Trimethylbenzene	8.4
Vinyl chloride	0.02
Xylene (mixed)	0.26

NOTES:
All soil cleanup objectives (SCOs) are in units of parts per million (ppm).
1 The SCO for Hexavalent or Trivalent Chromium is considered to be met if the analysis for the total species of this contaminant is below the SCO for Hex Chrom.
2 The SCO is the sum of endosulfan I, endosulfan II, and endosulfan sulfate.
3 For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.

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8 Stormwater Pollution Prevention

When remedial actions require the disturbance of more than one acre of land, federal and state laws[1] require that the project obtain coverage under the NYSDEC SPDES General Permit for Storm Water Discharges from Construction Activities that are classified as "Associated with Industrial Activity", Permit #GP-93-06 (Construction Storm Water General Permit). The BCP Site is 3.3 acres, and the overall project will effect a total of 3.3 contiguous acres. Requirements for coverage under the Construction Storm Water General Permit include the submittal of a Notice of Intent Form and the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP for the site will be prepared by the construction contractor in accordance with the New York State Storm Water Management Design Manual (2010). The SWPPP will provide the following information:

[1] The Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et Seq.) and the New York State Environmental Conservation Law: Article 17, Titles 7 and 8 and Article 70.

i. A background discussion of the scope of the construction project.

ii. A statement of the storm water management objectives.

iii. An evaluation of post-development runoff conditions.

iv. A description of proposed storm water control measures.

v. A description of the type and frequency of maintenance activities required to support the control measure.

The SWPPP will also address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, ecological protection, physical site characteristics that impact design, and site management planning. The SWPPP will also include a contingency plan to be implemented in the event that heavy rain events are determined to be impacting water quality in the Site due to cleanup and redevelopment activities. All descriptions of proposed features and structures at the Site includes a description of structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design

criteria.

The use of appropriate temporary erosion control measures such as silt fencing and/or hay bales will be required around all soil/fill stockpiles and unvegetated soil surfaces during redevelopment activities. Stockpiles shall be graded and compacted as necessary for positive surface water runoff and dust control. Stockpiles of soil/fill will be placed a minimum of ten feet from the property boundary.

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

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

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

9 Contingency Plan

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

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL

volatiles and semi-volatiles, TCL pesticides and PCBs), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC"s Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Final Engineering Report.

10 Community Air Monitoring Plan

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

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

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

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 will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

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

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

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. 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.

As is or otherwise specified, upwind concentrations should be measured at the start of

each workday and periodically thereafter to establish 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 on-site levels in excess of 5 ppm over background but less than 25 ppm persist then 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 15-minute readings on the perimeter in excess of 5 ppm over background but less than 25 ppm persist, then on-site activities must cease until levels are addressed.

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

If airborne dust is observed leaving the work area above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the

downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

10.1 ODOR CONTROL PLAN

Based on the primary constituents of concern, metals, VOCs and SVOCs, as well as the field experience that odors were observed on-site, odors are anticipated to be a possible issue or concern.

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

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

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

10.2 OTHER NUISANCES

If buried drums or previously unknown underground storage tanks are encountered

during soil excavation activities, excavation will cease and the NYSDEC will be immediately notified. All drums and/or underground storage tanks encountered will be evaluated and a removal plan will be submitted for NYSDEC approval. Appropriately trained personnel will excavate all of the drums and/or underground storage tanks while following all applicable federal, state, and local regulations. Removed drums and storage tanks will be properly characterized and disposed off-site. The soil/fill surrounding the buried drums or underground storage tanks will be considered as potentially contaminated and will be stockpiled and characterized.

11 Health And Safety Procedures For Intrusive Activities

Contractors engaged in subsurface construction activities (e.g., foundation and utility workers) will be required to implement appropriate health and safety procedures. These procedures will involve, at a minimum, donning adequate personal protective equipment, performing appropriate air monitoring, and implementing other engineering controls as necessary to mitigate potential ingestion, inhalation and contact with residual constituents in the soils. A site-specific, activity-specific health and safety plan will be prepared for the Site by the Construction Contractor (Contactor). Recommended health and safety procedures include the following:

- While conducting invasive work at the Site, the Contractor should provide working conditions on each operation that shall be as safe and healthful as the nature of that operation permits. The Contractor shall comply with all New York State Department of Labor regulations and published recommendations and regulations promulgated under the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance. The Contractor shall ensure that all work is performed in accordance with recognized safe work practices.

- The Contractor is responsible for the safety of the Contractor's employees, the public and all other persons at or about the Site of the work. The Contractor is solely responsible for the adequacy and safety of all

construction methods, materials, equipment and the safe prosecution of the work.

- The Contractor shall stop work whenever a work procedure or a condition at a work Site is deemed unsafe by the safety professional or his trained safety representative(s).

- The Contractor shall employ a properly qualified safety professional whose duties shall be to initiate, review and implement measures for the protection of health and prevention of accidents. The Contractor shall also employ safety representative(s) whose duties, working under the direct supervision of the safety professional, shall include the implementation the safety program for the work at the Site.

- Recognition as a safety professional shall be based on a minimum of certification by the Board of Certified Safety Professionals as a Certified Safety Professional and 5 years of professional safety management experience in the types of construction and conditions expected to be encountered on the Site.

- The safety representative(s) who will work under the direction of the safety professional will have appropriate qualifications. The required qualifications shall include a minimum of: five years of relevant construction experience, two years of which were exclusively in construction safety management; successful completion of a 30-hour OSHA Construction Safety and Health training course; 40-hour training as per 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response; and, if confined space entry is required, training as per 29 CFR 1910.146, Permit-Required Confined Spaces.

- The safety professional shall visit and audit all work areas as often as necessary but at least once each week and shall be available for consultation whenever necessary.

- The safety representative(s) must be at the job site full-time (a minimum of 8 hours per working day) whenever work is in progress. When multiple shift work is in progress more than one safety representative may be required.

- The safety professional and his safety representative(s) shall be responsible for ensuring Contractor compliance with governing laws, rules and regulations as well as of good safety practice.

- The safety staff shall maintain and keep available safety records, up-to-date copies of all pertinent safety rules and regulations, Material Safety Data Sheets, and the Contractors' Site specific health and safety plans (HASPs) and the Site emergency response plan with emergency and telephone contacts for supportive actions.

- The responsible safety professional shall sign and seal the Contractor's written site-specific HASP and the Plan shall be available to workers on Site. The Contractor shall provide copies of the HASP to the Contractors' insurer, if required.

- The safety professional and/or his trained safety representative(s) shall as a minimum:

    - Schedule and conduct safety meetings and safety training programs as required by law, the health and safety plan, and good safety practice. A specific schedule of dates of these meetings and an outline of materials to be covered shall be provided with the health and safety plan. All employees shall be instructed on the recognition of hazards, observance of precautions, of the contents of the health and safety plan and the use of protective and emergency equipment.

    - Determine that operators of specific equipment are qualified by training and/or experience before they are allowed to operate such equipment.

    - Develop and implement emergency response procedures. Post the name, address and hours of the nearest medical doctor, name and address of nearby clinics and hospitals, and the telephone numbers of the appropriate ambulance service, fire, and the police department.

    - Post all appropriate notices regarding safety and health regulations at locations that afford maximum exposure to all personnel at the

job Site. Post appropriate instructions and warning signs in regard to all hazardous areas or conditions that cannot be eliminated. Identification of these areas shall be based on experience, on-site surveillance, and severity of hazard. Such signs shall not be used in place of appropriate workplace controls.

- Ascertain by personal inspection that all safety rules and regulations are enforced. Make inspections at least once a shift to ensure that all machines, tools and equipment are in a safe operating condition; and that all work areas are free of hazards. Take necessary and timely corrective actions to eliminate all unsafe acts and/or conditions, and submit to the Engineer each day a copy of his findings on the inspection check list report forms established in the health and safety plan.

- Provide safety training and orientation to authorized visitors to ensure their safety while occupying the job Site.

- Perform all related tasks necessary to achieve the highest degree of safety that the nature of the work permits.

- The Contractor shall have proper safety and rescue equipment, adequately maintained and readily available, for foreseeable contingencies. This equipment may include such applicable items as: proper fire extinguishers, first aid supplies, safety ropes and harnesses, stretchers, water safety devices, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, combustible gas detectors, etc. This equipment should be kept in protected areas and checked at scheduled intervals. A log shall be maintained indicating who checked the equipment, when it was checked, and that it was acceptable. This equipment log shall be updated monthly and be submitted with the monthly report. Equipment that requires calibration shall have copies of dated calibration certificates on-site. Substitute safety and rescue equipment must be provided while primary equipment is being serviced or calibrated.

- All personnel employed by the Contractor or his subcontractors or any visitors whenever entering the job Site, shall be required to

wear appropriate personal protection equipment required for that area. The Contractor may remove from the Site any person who fails to comply with this or any other safety requirement.

12 Standard Operating Procedures

SCREENING SOIL SAMPLES

This guideline presents a method for screening soil samples. During soil/fill excavation activities, a photo ionization detection (PID) will be used to monitor the excavated soils. The monitoring results provide criteria for sampling of soil potentially impacted by volatile organic substances.

Equipment Requirements

- 40 ml. precleaned and prelabeled glass VOA vials with Teflon-lined septum caps.
- Ice and ice chest.
- Wide mouthed glass jars with screw caps.
- Aluminum foil.
- Photoionization detector.

Methodology

- During excavation, the excavated soil will be examined for visually contaminated (stained) soils. If present, these areas will be sampled first. If no staining is observed, collect samples from each stockpile at random locations. Place the sample in a labeled wide-mouthed glass jar. Seal the jar with aluminum foil and a screw top cap.
- Keep these samples at as near to 70°F as possible.

- Check head space of each sample for any organic vapor present by inserting the probe of the PID through the aluminum foil seal.

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- The soil sample from each excavation location will be noted where VOA's were detected and removal of the contaminated soil will be coordinated per project requirements.

COLLECTING COMPOSITE SAMPLES

This guideline addresses the procedure to be used when soil samples are to be composited in the field.

- Transfer equal portions of soil from individual split-spoon samples to a large pre-cleaned stainless steel (or Pyrex glass) mixing bowl.
- Thoroughly mix (homogenize) and break up the soil using a stainless steel scoop or trowel.
- Spread the composite sample evenly on a stainless steel tray and quarter the sample.
- Discard alternate (i.e. diagonal) quarters and, using a small stainless steel scoop or spatula, collect equal portions of subsample from the remaining two (2) quarters until the amount required for the composite sample is acquired. Transfer these subsamples to a pre-cleaned stainless steel (or glass Pyrex) mixing bowl and re-mix.
- Transfer the composite sample to an appropriate pre-cleaned jars provided by the laboratory and label. Store any excess sample from the stainless steel tray in separate, pre-cleaned, sample containers, and submit to the laboratory for holding in case additional analysis is necessary.
- Decontaminate all stainless steel (or glass, Pyrex) trays, spoons, spatulas, and bowls in accordance with the sampling equipment decontamination procedure provided.

13 Quality Assurance / Quality Control

All characterization samples collected during redevelopment activities will be analyzed using EPA-approved analytical methods using the most recent edition of the EPA"s "Test Methods for Evaluating Solid Waste" (SW-846). Methods for Chemical Analysis of Water and Wastes "(EPA 600/4-79-020), Standard Methods for Examination of Waste and Wastewater" (prepared and published jointly by the American Public Health Association, American Waterworks Association and Water Pollution Control Federation).

The laboratory proposed to perform the analyses will be certified through the New York State Department of Health Environmental Laboratory Approval Program (ELAP) to perform Contract Laboratory Program (CLP) analysis and Solid Waste and Hazardous Waste Analytical testing on all media to be sampled during this investigation. The laboratory will maintain this certification for the duration of the project.

The laboratory will perform the analysis of samples in accordance with the most recent NYSDEC Analytical Services Protocol (ASP). Analytical data will be submitted in complete ASP Category B data packs including documentation of laboratory QA/QC procedures that will provide legally defensible data in a court of law. If requested, the Category B data packs will be submitted to the NYSDEC.

Procedures for chain of custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective actions shall be followed as per SW-846 and as per the laboratory's Quality Assurance Plan. Where appropriate, trip blanks, field blanks, field duplicates, and matrix spike, matrix spike duplicate shall be performed at a rate of 10% and will be used to assess the quality of the data. The laboratory's in-house QA/QC limits will be utilized whenever they are more stringent than those suggested by the EPA methods.

After receipt of analytical results, the data package will be sent to a qualified, third party, data validation specialist for evaluation. A Data Usability Summary Report (DUSR) will be prepared. The DUSR will provide a determination of whether or not the data meets the project specific criteria for data quality and data use.

14 Citizen Participation

As required in the Brownfield Cleanup Agreement, a Citizen Participation Plan (CPP) was prepared by the Volunteer and has been implemented by DEC and the Volunteer. The CPP was sent to the public document repository for public availability and the public has been kept informed at the numerous public meetings which have been held on the project and through fact sheets.

14.1 Schedule

The Volunteer intends to implement the remediation and achieve a Certificate of Completion (COC) from the NYSDEC in 2016 and place the new facility into service thereafter. The schedule for remediation and redevelopment of the Site is provided in **Figure 10**.

15 Final Engineering Report

Once the Site remediation has been completed, a Final Engineering Report (FER) will be prepared and submitted to the NYSDEC. The purpose of the FER will be to fully document the implementation of the Site remedy and to certify, by a registered Professional Engineer, that the remedial program activities were implemented in conformance with the NYSDEC-approved Remedial Work Plan.

The FER will include a description of the selected remedy, details and supporting documentation of remedial actions performed, and required certifications.

A checklist for FER approval, as provided by the NYSDEC will be used during FER preparation to assist with completeness and will be provided along with the FER submittal.

A NYSDEC-prepared FER Template will be used to prepare the FER to achieve consistency with NYSDEC expectations and to expedite NYSDEC review and approval of the FER.

16 References

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