Remedial Action Plan

Remington Rand
180 Johnson Street
Middletown, Connecticut

Prepared for

City of Middletown
245 deKoven Drive
Middletown, Connecticut

and

US EPA Region I
5 Post Office Square, Suite 100
Boston, MA 02109

Prepared by

VHB/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
54 Tuttle Place
Middletown, Connecticut 06457

January 2011

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1
Introduction

At the request of the City of Middletown (herein referred to as the "Client"), Vanasse Hangen Brustlin, Inc. (VHB) has prepared this Remedial Action Plan (RAP) for the Former Remington Rand Facility located at 180 Johnson Street in Middletown, Connecticut (herein referred to as the "Site"). This RAP was prepared for the Client and is subject to the terms and conditions of the Agreement between the Client and VHB, as well as the Limitations provided in Appendix A.

The remedial actions proposed include removal of underground storage tanks (USTs) and above ground storage tanks (ASTs), excavation and capping of cinder fill material along the east side of the building, removal/disposal of window systems containing asbestos caulking, glazing, and lead-based paint, and abatement of asbestos containing floor tile and pipe insulation in the eastern portion of the main building.

It is our understanding these remedial actions will be funded using EPA Brownfields Clean-up grant funds and loan funds obtained from the Connecticut Department of Economic and Community Development (DECD).

The purpose of this RAP is to: summarize existing data based upon previous Site investigations, develop a Conceptual Site Model (CSM) for proposed remedial areas, and evaluation of potential remedial activities to address hazardous building materials, existing ASTs and USTs, and contaminated cinder fill material along the east side of the building.

This RAP has been prepared in general accordance with the Connecticut Department of Environmental Protection (CTDEP) Site Characterization Guidance Document (SCGD) dated September 2007, Revised December 2010. Section 2 of this RAP contains the Alternative Brownfields Cleanup Analysis (ABCA) as required by EPA. In preparation of this RAP, VHB has relied on information contained in the following reports:

- Phase I Environmental Site Assessment, dated April 6, 1993, prepared by Soil Science and Environmental Services, Inc,
- Phase II Environmental Site Assessment, dated June 1997, prepared by VHB,
- Environmental Site Assessment and Consulting Services, dated January 1999, prepared by VHB,
- Remedial Action Plan, dated October 2000, prepared by VHB,

- Pre-Renovation Hazardous Materials Inspection Report, dated July 2000, prepared by Eagle Environmental Inc.,
- Remedial Investigation/Remedial Action Report (RI/RAP), dated September 2008, prepared by LBG,
- Conditional Approval for RI/RAP, dated June 2009, prepared by CTDEP,
- Pre-Design Investigation Work Plan, dated December 2009, prepared by Geosyntec Consultants, and
- Analytical results for PCB caulk sampling, dated June 7, 2010, prepared by Complete Environmental Testing Laboratories (CET).

The above reports identify numerous release areas at the Site. However, a potential responsible party (PRP) has been identified for the majority of the releases. The PRP is Unisys Corporation (Unisys), predecessor of Remington Rand. On March 11, 2002, CTDEP issued a Consent Order (#SRD-135) requiring Unisys to investigate and remediate soil and groundwater contamination at the Site resulting from Remington's historic operations. Additional information has been provided in the Background/Site History section of this document.

According to Paul Jameson, CTDEP's Project Manager for the Site, Unisys is responsible for remediation of petroleum impacted soils and groundwater resulting from USTs or ASTs, but not for the physical removal of the tanks. Furthermore, CTDEP to date has not officially named Unisys as a responsible party for placement of the cinder fill. This RAP is intended to address only specific areas of the Site where Unisys has not been deemed responsible or confirmed as the responsible party for resulting contamination (i.e. hazardous building materials, cinder fill, and removal of known USTs and ASTs). This RAP does not address any other release areas or environmental concerns identified at the Site.

No groundwater remediation or post remediation groundwater monitoring are planned as part of these activities. VHB understands that potential post remediation groundwater monitoring will be addressed by Unisys as part of the Consent Order.

Background/ Site History

The Site consists of 10.458 acres of land located at the north end of Johnson Street in Middletown, CT. It is identified by the City of Middletown Tax Assessor's Office on Map 20 as Lot 13, Block 12-22 and is currently owned by the City of Middletown. The Site is zoned for industrial redevelopment. Figure 1 depicts the Site location and Figure 2 depicts the Site configuration.

There are three (3) buildings located on the Site including a large main building (175,000 ft^2), a boiler building (11,550 ft^2), and Quonset hut (2,400 ft^2). The remaining portions of the Site consist of an access drive and landscaped areas that surround the building, parking areas, and areas of undeveloped land. A chain-link fence surrounds the majority of the Site. Numerous catch basins are located in the lawn areas and driveways. A right-of-way for Northeast Utilities overhead electric lines crosses the eastern corner of the property. The Site is provided with City water, natural gas, and electrical utilities. The Site has historically utilized an on-Site septic system. However, the City recently connected the building to the municipal sewer system.

The building was formerly heated by two large steam furnaces (boilers) located in the boiler building at the eastern end of the property. The boilers were reportedly first fired by coal, but later by fuel oil. The fuel oil was reportedly stored in two ASTs located on the east side of the boiler building including a 20,000-gallon AST and a 1,000-gallon AST. Three USTs have also been identified at the Site.

According to documentation, the Site was used for manufacturing from 1897 to approximately 1971. Prior to 1897 the Site was comprised of undeveloped wetlands and wooded areas. Initial Site development began in 1897 when the main building was constructed by the Keating Wheel and Automobile Company (circa 1897 to 1900). Eisenhuth Horseless Vehicle Company reportedly owned the Site from 1900 to 1909. Remington Noiseless Typewriter Company (Remington) reportedly owned the Site from approximately 1909 to approximately 1970. Sometime in the 1940s Andover Ken Aviation reportedly used the Site to manufacture metal goods and munitions to support World War II efforts. After 1970, the Site was occupied and owned by various tenants for storage and office space. It is reported that a manufacturer of windows and kitchen cabinets operated at the Site in 1987 and 1988.

The Site was acquired by the City of Middletown (City) in 2000. Tenants since that time have included a tradeshow company, landscaper, direct-mail company, electrical contractor, paint & wall paper contractor, flooring contractor, outdoor lawn furniture manufacturer, an HVAC contractor, motor cycle shop, and various individuals for storage of appliances, miscellaneous house wares, and vehicles.

Environmental Setting

Topography

The Site is located at approximately 15 to 20 feet above mean sea level (AMSL). The topography of the Site is generally flat with the exception of abrupt slopes along the eastern property line that transition between the developed portions of the property and bordering woodland and wetland areas.

Surface Water

The Site is located within the Connecticut River major drainage basin and the Mattabesset River regional drainage basin. The western portion of the Site is located within the Coginchaug River subbasin of the Mattabesett River regional drainage basin.

The Site is bordered to the north by the Mattabessett River and associated wetlands, and to the west by the Coginchaug River and wetlands. The confluence of these rivers is located approximately 1,800 feet northwest of the Site. The Mattabessett River discharges to the Connecticut River approximately 1,200 feet northeast of the Site.

The Coginchaug River in the area of the Site is designated by the CTDEP as a Class "B" surface-water body. This classification presumes some level of degradation, but is still considered suitable for wildlife and aquatic life habitats, recreation, navigation, and industrial/agricultural water supplies.

The Mattabessett and Connecticut Rivers are both designated by the CTDEP as Class "C/B" or "D/B" surface-water bodies. These designations indicate that one or more criteria or designated uses that apply to Class B waters are not being met, but the goal is to meet the Class B requirements.

Wetland Areas and Flood Zones

Federal Emergency Management Agency flood plain mapping depicts the Site as being within the 100 year flood plain for the Mattabesset River. The northeastern portion of the Site is considered to be within the floodway for this river. Wetlands associated with the Mattabesset River occupy the north and eastern portions of the Site. As required by the state funding source, a Flood Management Certification was completed for the project which states that soil stockpiling will be limited to less than 100 cubic yards within the 100 year floodplain and no stockpiling will occur within the 50 foot wetland buffer for the Site.

Surficial and Bedrock Geology

Based upon Geographic Information System (GIS) data compiled by the CTDEP, surficial materials in the vicinity of the Site are classified as thick till.

According to the Bedrock Geological Map of Connecticut, compiled by John Rodgers 1985, available digitally through GIS data available from the CTDEP bedrock at the Site is identified as a Portland Arkose, a reddish-brown sandstone and conglomerate. Depth to bedrock beneath the Site is unknown, but has reportedly not been encountered during previous investigations (>25 feet below grade).

Based on subsurface investigations conducted at the Site, fill materials were encountered across the Site at depths ranging from near grade to 10 feet below grade (ft bg). Fill material at the Site in some areas is comprised of cinders, brick fragments, glass, metal, ash, and coal. The thickest accumulations of fill materials were reportedly encountered northeast and southeast of the main building. A clay layer has been identified beneath the Site at depths ranging from 7.5 to 18 feet bg.

Hydrology

According to the CTDEP Water Quality Classification Map of Connecticut, groundwater at the Site is classified as "GB." This classification is assigned to areas of historically, highly urbanized activity and areas of industrial activity where public water is available. Groundwater in GB classified areas is presumed unsuitable for human consumption without treatment.

Groundwater impacts have been documented for the Site including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and extractable total petroleum hydrocarbons (ETPH). A groundwater monitoring program for natural attenuation of groundwater impacts has been proposed by Unisys and provided conditional approval by CTDEP.

According to documentation, an "Artesian Well" exists on the north side of the Site. The origin and construction of this well is unknown. This well is reportedly not in use.

Depth to groundwater beneath the Site reportedly ranges from 9 to 21 feet bg. Groundwater flow direction during seasonal high conditions is reported to the northeast to the Mattabesset River. During seasonal low water conditions, flow direction beneath the east-central portion of the Site reportedly shifts more easterly. Site groundwater is believed to discharge directly to the wetlands located on the east and northeast sides of the Site.

Surrounding Land Use

The Site is bordered to the northwest by the City of Middletown Municipal Landfill, to the north and east by undeveloped wetlands and the Mattabesset River beyond, and to the south and west by the Providence and Worcester Railroad and several industrial/commercial businesses beyond. The area to the south of the Site was historically used for industrial purposes.

Applicable Remediation Standards

Analytical results for soil discussed within this RAP have been compared to the CTDEP Remediation Standard Regulations (RSRs), CGS Section 22a-133k. The RSRs define the standards applicable to the Site dependent on the groundwater classification (mapped by CTDEP) and uses of the property.

Soil Remediation Standards

Based on relevant Site data, the CTDEP Residential Direct Exposure Criteria (RDEC), Industrial/Commercial DEC (I/C DEC), and Pollutant Mobility Criteria for GB areas (GB PMC) apply to the Site's soil. RDEC applies to soil at the Site since the RSRs require, whenever feasible, a reduction in residual soil contaminant concentrations to levels that pose no significant human health risk (residential standards). Under circumstances where remediation is not practical, an Environmental Land Use Restriction can be applied to the Site limiting future use solely to industrial/commercial purposes.

It is our understanding that stakeholders have agreed to implement a Site-wide ELUR limiting future use of the Site to commercial/industrial uses in support of the overall remediation of the Site.

Groundwater Remediation Standards

The Surface Water Protection Criteria (SWPC), Residential Volatilization Criteria (R VC), and Industrial/ Commercial Volatilization Criteria (I/C VC) have been used as a means of comparison for Site groundwater quality. No groundwater remediation or post remediation groundwater monitoring are planned as part of this RAP. VHB understands that potential post remediation groundwater monitoring will be addressed by Unisys.

Hazardous Building Material Regulations

There are various laws and regulations governing the removal and disposal of hazardous building materials. Regulating agencies include United States Environmental Protection Agency (EPA), Occupational Safety & Health Administration (OSHA), and Connecticut Department of Public Health (CTDPH). Some regulations include Asbestos Hazard Emergency Response Act (AHERA), National Emissions Standards for Hazardous Air Pollutants (NESHAPS), Toxic Substance Control Act (TSCA), Resource Conservation and Recovery Act (RCRA), and Connecticut General Statutes CGS Section 19a and 20-440.

Prior to hazardous building material abatement an Asbestos Management Planner will be retained to prepare an abatement work plan that will identify the means and methods for abatement and disposal of hazardous building materials in accordance with all state and federal regulations.

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Conceptual Site Model

The following section discusses constituents of concern (COCs), potential constituent migration pathways, and potential environmental receptors identified at the Site in association with the target remedial areas. The information contained in this conceptual site model (CSM) was compiled from previous reports available for the Site including LBG's 2008 RAP. This CSM was prepared in accordance with CTDEP's "Site Characterization Guidance Document".

Areas of Concern

The specific areas of concern that are the subject of this RAP are described below.

ASTs and USTs

- AST-1 : A 1,000-gallon steel AST (age unknown) is located along the southeast corner of the boiler building. This AST is surrounded by a concrete berm and reportedly stored No. 2 fuel oil. This AST is empty except for a few inches of sludge. Piping from this tank is routed above ground to the adjacent boiler room.

- AST-2: A 20,000-gallon steel AST, reportedly installed prior to 1959, is located on the east side of the boiler building. This AST rests on concrete cradles and reportedly stored No. 4 and No. 6 fuel oil for heating the main building. Piping is routed underground to the boiler room. The AST is reportedly empty except for a few inches of sludge.

- UST-4: A 500 gallon single-walled UST, installed prior to 1950, is located on the north side of the main building. This UST is reportedly filled with water but was formerly used to store gasoline. Petroleum impacts were identified in soil and groundwater near this UST.

- UST-6: A UST containing a mixture of waste oil and water is located on the northeast side of the main building. The size of the UST is unknown but estimated to be 500 to 1,000-gallons. Petroleum impacts were identified in association with this UST. The release was reported to be limited in extent.

- UST-7: Another UST (size unknown) is reportedly abandoned in place (filled with concrete) along the northeast corner of the main building in the access roadway between the main

building and boiler building. No petroleum impacts were reportedly identified in association with this UST.

The remedial action proposed in this RAP is to excavate and remove the above identified USTs and ASTs for proper off-site disposal/recycling. If time and funding permit, petroleum impacted soils encountered during UST removal will be excavated, stockpiled on-Site, and sampled for waste characterization purposes to determine potential disposal options for this material. Excavations will be backfilled with clean backfill obtained from an off-site source to match existing grade.

Cinder Fill Area

Cinder fill material has been identified along the eastern portion of the Site in association with the "Railroad Spur Disposal Area". This area has been delineated during previous investigations and extends easterly from the eastern portion of the building and appears to become co-mingled with an industrial fill area consisting of metal shavings. Depth of the cinder fill along the eastern portion of the building (in the proposed remedial area) is approximately 0-4 feet below grade.

The remedial action proposed in this RAP is to excavate cinder fill material from 0-2 feet below grade in the area along the eastern side of the building. The aerial extent of the excavation will be approximately 8,000 square feet. The excavated material will be live loaded for transport off-site to an approved licensed disposal facility. The excavated area will then be backfilled with two (2) feet of clean fill material and capped with a minimum of three (3) inches of bituminous pavement.

Hazardous Building Materials

Asbestos containing caulking and glazing and lead based paint have been identified in association with window systems. Asbestos containing pipe insulation and floor tile have been identified interior to the building.

The remedial action proposed includes removal and replacement of approximately 100 windows in the main building and if time and funding permit abatement of approximately 1,500 square feet of floor tile and 200 linear feet of pipe insulation. The means and methods for removal of these materials will be determined by a licensed Asbestos Management Planner. A written abatement plan will be submitted to the CTDPH for approval prior to initiation of proposed remedial work.

Constituents of Concern

The constituents of concern (COCs) for each target remedial area are listed below. This information was obtained from LBG's 2008 Remedial Action Plan and GeoSyntec PreDesign Investigation Work Plan.

ASTs and USTs

- *AST-1: (1,000-gallon No. 2 heating oil AST)*
  Surficial soil samples collected near this AST reportedly did not exhibit visual or olfactory petroleum impacts (i.e. staining or odors). A sample was not collected for analysis.

  COCs related to storage of heating oil include ETPH, aromatic VOCs, SVOCs, and MTBE.

- *AST-2: (20,000-gallon No. 4 and No. 6 heating oil AST)*
  Visible evidence of petroleum impacted soil was identified beneath this AST. Samples collected from soil borings identified TPH in the soil at 8 to 12 feet bg at concentrations above the I/C DEC and GB PMC. Due to the depth of the impacts, the source was attributed to subsurface piping and/or releases from a nearby UST (i.e. UST-7).

  COCs related to the storage of heating oil include ETPH, aromatic VOCs, SVOCs, and MTBE.

- *UST-4: (500-gallon gasoline UST)*
  Petroleum impacts to soils were identified in the vicinity of this UST. TPH at concentrations above the I/C DEC and GB PMC were identified. Chlorinated VOCs (CVOCs) were also identified in soils and groundwater. CVOC concentrations in soils and groundwater have been attributed to solvent releases associated with the main building and are not believed to be related to this UST.

  COCs related to storage of gasoline include aromatic VOCs, MTBE, and lead.

- *UST-6 (500 or 1,000-gallon waste oil UST)*
  Soil from below the water table near this UST contained TPH at concentrations above the I/C DEC and GB PMC.

  COCs related to the storage of waste oil include ETPH, aromatic VOCs, MTBE, halogenated VOCs, RCRA 8 metals and PCBs.

- *UST-7 (contents and size unknown)*
  Soil from below the water table near this UST contained TPH concentrations above the RES DEC but not above the I/C DEC or GB PMC. The former contents of this UST are unknown.

  COCs for this UST would include all typical petroleum parameters including ETPH, VOCs, SVOCs, MTBE, and RCRA 8 metals.

Cinder Fill Area

- Concentrations of arsenic, lead, nickel TPH, and SVOCs that exceed the Industrial/Commercial Direct Exposure Criteria (I/C DEC) have been identified at depths of 0-4 feet bg;
- Concentrations of leachable lead and nickel, TPH, and SVOCs that exceed the GB Pollutant Mobility Criteria (PMC) have been identified at depths of 0-4 feet bg;

COCs associated with the cinder fill material include metals (arsenic, lead, and nickel), TPH, and SVOCs.

Hazardous Building Materials

- Asbestos containing building materials (ACM) and lead-based paint have been identified in association with the main building. ACM was identified in association with window systems, floor tile, pipe insulation, and other building materials. Lead based paint was also found in association with window systems and other building components.
- Sampling results indicate that window caulk does not contain polychlorinated biphenyls (PCBs).

COCs associated with building materials include asbestos, lead-based paint, and PCBs in caulking.

Environmental Receptors

Potential pathways for migration of contamination in target remedial areas include surface erosion and gravity leaching through soils into groundwater. Once in groundwater potential pathways of migration include: groundwater flow, the underground storm water drainage system and other underground utilities which may act as preferential pathways. Although reportedly there is an "artesian well" on-site, it is not known to be in use. Public water is supplied to the Site. There are no known existing uses of groundwater on or in the vicinity of the Site.

Environmental receptors include wetlands on the north and east sides of the Site. Groundwater from the Site has been reported as discharging directly to these wetlands. Studies are currently being conducted by Unisys to determine potential impacts to these wetland areas from on-Site groundwater contributions as per the Consent Order. It is our understanding that DEP considers Unisys responsible for groundwater contamination existing at and originating from the Site. Therefore, no provisions for evaluating groundwater contributions from target remedial areas are provided as part of this RAP. The potential environmental receptors are located more than 50 feet from the proposed remedial areas; excavation and stockpile activities will be limited to less than 100 cubic yards; and stockpiles will be located outside the 50 foot wetland buffer for the Site. Proper excavation and handling of impacted soils as well as, proper sedimentation and erosion controls will be required so that Site workers and nearby environmental receptors are not exposed. Proposed remedial activities are not expected to adversely impact or contribute to the existing groundwater contamination at the Site or on-going impacts to nearby wetland areas.

The Site is used as a commercial complex and is currently 80% occupied. Therefore potential human exposure (i.e. tenants) would be considered an environmental receptor for the proposed remedial activities and is discussed in further detail below.

ASTs and USTs

Potential human exposure to petroleum impacted soils associated with USTs is currently limited due to the depth of these impacted soils below grade (beginning at least 4 feet bg). Although petroleum-impacted surface soils have been identified in association with AST-2, this area is surrounded by fencing and is not readily accessible.

Petroleum-impacted soils are expected to be encountered during AST and UST removal. As previously noted, this proposed remedial action only involves the removal of these tanks. However, it has been agreed upon by stakeholders that if time and funding permit, petroleum-impacted soils encountered beneath the USTs during removal will also be excavated, stockpiled on-Site, and sampled for waste characterization purposes to determine potential disposal options for this material.

Cinder Fill Area

There is potential for human exposure to cinder fill material located on the east side of the building where fill material was found to be shallow (0-2 feet bg). Potential exposure to the cinder fill material is currently limited due to the industrial/commercial use of the Site. The proposed remedial action for this area would reduce the potential for long-term exposure by excavation of surface material and capping of remaining material at depth. Live loading of this material is anticipated and dust suppression techniques will be implemented to reduce potential human exposure or migration of contaminants.

Hazardous Building Materials

There is potential for human exposure to asbestos and lead during removal of hazardous building materials. A licensed Asbestos Management Planner will be retained to develop an abatement plan for the removal of windows, floor tile, and pipe insulation. A licensed abatement contractor will be retained to implement the plan. Since the building will be occupied during abatement activities, air monitoring during abatement activities and air clearance sampling as part of post abatement activities is anticipated to minimize potential human exposures to asbestos fibers. During window removal activities, poly sheeting will be used on exterior portions of the building to prevent asbestos containing materials and lead based paint from coming into contact with surface soils. Following window removal activities, a post-abatement visual inspection will be conducted to confirm surface soils around the building are free of asbestos containing materials and lead paint chips.

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Alternative Brownfields Clean-up Analysis

As required by the funding source, an Alternative Brownfields Clean-up Analysis has been prepared for the proposed remedial actions.

Hazardous Building Materials

The proposed remedial activities involving hazardous building materials includes removal of approximately 100 asbestos and lead containing windows systems associated with the main building and removal of approximately 1,500 square feet of asbestos containing floor tile and 200 linear feet of pipe insulation in the eastern portion of the main building.

Potential remedial alternatives for hazardous building materials could include encapsulation or leaving in place and doing nothing. Based on the deteriorated condition of these materials, potential exposure to building occupants, and the need for structural improvements to achieve energy efficiency and building code compliance the do nothing alternative is not a viable option.

Encapsulation of these materials would be the primary alternative to removal. However, this is not the most viable long-term solution since future window or plumbing repairs would require accessing these components and possible future abatement of materials to facilitate repairs.

The preferred remedial alternative for these hazardous building materials is to conduct abatement activities in conjunction with planned renovation activities for the building.

Asbestos containing or asbestos contaminated materials are expected to be properly abated and transported off-site for proper disposal at a licensed facility. Currently the only cost effective treatment/disposal option available for asbestos is land filling. There may be potential for recycling the metal window frames with lead-based paint if the frames are not contaminated with asbestos. This will be evaluated by a licensed asbestos inspector/project monitor at the on-set of the abatement project.

Cinder Fill and USTs/AST Removal

The proposed remedial activities include removal of two ASTs and three USTs of various sizes. If time and funding permit, petroleum impacted soils will be excavated, stockpiled on-Site and

sampled for waste characterization purposes to determine potential disposal options for this material. Additionally, cinder-fill material from depths of 0 to 2 feet bg along the east side of the main building will be excavated and disposed off-Site. This area will be backfilled with two feet of clean fill material (soil cover) and capped with three-inches of bituminous pavement (engineered control).

The following potential soil remedial alternatives presented below were obtained from LBG's 2008 RAP prepared on behalf of Unisys. These alternatives were developed for the various fill materials and petroleum impacted soils existing at the Site. The "do nothing" option is not viable for the Site since the ASTs/USTs are out of compliance and need to be removed under current laws and the cinder fill material is exposed at grade and presents a threat of direct exposure and migration through erosion.

Institutional Controls

Environmental Land Use Restrictions (ELURs) are legal limitations placed on the land records that can be used instead of, or in conjunction with, remediation to ensure that Site conditions are protective of human health and the environment. An ELUR is used to allow COCs to remain on-Site so implementation of the ELUR itself does not result in a reduction in COC concentrations.

Standard ELUR provisions place restrictions on the use of the subject area by the owner or anyone holding interest in the property and grants to the CTDEP an easement to access the subject area and take actions necessary to abate a threat to human health and the environment. ELURs can be used in the following ways:

- An ELUR can be used to render soil 'inaccessible' that is below a building or other permanent structure, that is four feet or more below grade, and/or that is two feet or more below an approved paved surface.

- An ELUR can be used to render soil above the seasonally high water table (in a GB area) 'environmentally isolated', prohibiting the exposure of impacted soil to infiltrating precipitation, thereby preventing leaching of COCs to groundwater.

- An ELUR can be used to prevent construction of a building above an area where VOCs are present in groundwater, thereby allowing VOCs at concentrations above applicable criteria to remain in place.

The process of instituting an ELUR includes the following:

- The intent to institute an ELUR must be published in a newspaper of general circulation in the Site area (public notice). Publishing is not required if the ELUR is only for the purpose of restricting land use to industrial/commercial activities.

- A draft declaration of the ELUR and decision document must be prepared and submitted to CTDEP along with an A-2 survey and a certified copy of the public notice.

- The application of an ELUR to the land records will require the cooperation and permission of the landowner and the other easement holders. Subordination agreements and/or certificate of title, if required, must be prepared, executed, and submitted to CTDEP for review and approval.

- The ELUR must be recorded on the land records and written notification must be sent via certified mail to municipal officials and persons who commented on the ELUR.

The ELUR contains a provision for the temporary suspension of specified provisions of the ELUR in the event of an emergency that presents a "significant" risk to human health or the environment. To request a permanent release from the provisions of the ELUR or a release for non-emergency activities, the owner would have to make a request and obtain approval for the release and, presumably, would have to agree to conditions specified by the CTDEP that would assure that actions taken or future conditions in the subject area do not pose a threat to human health and the environment. The CTDEP release would then have to be recorded on the land records.

Engineered Controls

Engineered controls can be used to isolate impacted soils from direct contact and to minimize leaching of COCs to groundwater. Engineered controls isolate and control the migration of COCs, but do not reduce the level of COCs. Implementation of an engineered control requires adequate time for approvals, design, and construction. Monitoring and maintenance activities are required long term in association with this remedial alternative. Engineered controls, as described in RCSA Section 22a-133-2(f)(2), may be used with CTDEP approval if:

1) The CTDEP authorized the disposal of solid waste or impacted soil;
2) Remediation of the soil is not technically practicable;
3) The CTDEP and the Department of Public Health have determined that the removal actions would create an unacceptable risk to human health; or
4) The cost of remediation is significantly greater than the cost of an engineered control and that the cost difference outweighs the risk of human health and the environment should the control fail.

If implemented in accordance with regulations, the DEC and PMC do not apply to soils below the engineered control.

To obtain CTDEP's approval to use an engineered control, a report must be submitted that demonstrates how it will be designed, constructed, and maintained to achieve the objectives of effectively isolating the underlying soil. In addition, a groundwater monitoring plan must be prepared and an appropriate ELUR will need to be implemented. A surety is required to cover the cost of maintenance and monitoring (the amount of the reserve to be increased annually over five years until the amount is equal to the cost of five years maintenance and monitoring).

Specific design considerations for an engineered control include:

1) Isolate the impacted soil and minimize migration of liquids through the soil;
2) Promote drainage and minimize erosion;

3) Accommodate settling and subsidence, maintain structural integrity, and function with minimal maintenance; and
4) With respect to an engineered `cap', have a vertical permeability of less than 10^{-6} cm/second, as specified by CTDEP.

Soil Cover ('Inaccessible Soil')

Soil cover used to render impacts inaccessible is a potential remedial alternative. By definition, soil that is rendered inaccessible and where an ELUR is in place to prohibit disturbance is not subject to the DEC. Inaccessible soil is defined as soil more than four feet bg, or more than two feet below a qualifying paved surface, building, or other permanent structure. The purpose of the soil cover is to prevent direct contact with the soil by rendering it inaccessible.

Inaccessible soil is still subject to the PMC, so those areas where the PMC is exceeded must be addressed with an alternative approach. Additional data may be required for use in calculating the 95% upper confidence limit (95% UCL). If the 95% UCL is less than the GB PMC and the CTDEP agrees to waive the requirement that the concentration of no single sample exceeds two times the criteria, then compliance with the GB PMC may be demonstrated.

To implement a soil cover, pre-design studies may be needed to evaluate the stability of materials. Where site area is limited, partial fill removal or surface regrading might be required to accommodate the addition and grading of the imported cover materials. In addition, drainage systems may need to be modified to accommodate the altered surface drainage patterns and possible increased runoff. Asphalt or other pavement used as part of a soil cover should be maintained in good condition. If the design does not include pavement, the design should include vegetative cover or another stabilizing material to prevent erosion. An ELUR that prohibits excavation in the area will also be necessary.

In-Situ Bioremediation

Bioventing is an in-situ remediation technology that uses indigenous microorganisms to biodegrade organic constituents adsorbed to soil in the unsaturated zone. Soils in the capillary fringe and saturated zones are not affected. In bioventing, the activity of the indigenous bacteria is enhanced by inducing air (or oxygen) flow into the unsaturated zone (using extraction or injection wells) and, if necessary, by adding nutrients. Remedial technologies that improve air flow through the unsaturated soil include soil-vapor extraction (SVE) and high-vacuum extraction (HVE) systems. Air recovered by the system is replaced with air from the atmosphere, which may contain more oxygen.

Bioventing would only be considered for certain COCs that are conducive to degradation by this remedial technique. This would not be considered a stand-alone remedial technology for the Site. However, it would aid in achieving the DEC and PMC criteria for TPH in unsaturated soil locations. This technology will not treat metals in the subsurface and therefore is not a consideration for the cinder fill area. This technology is potentially suitable where TPH and VOCs are the predominant COCs in soil.

Excavation with Disposal or Treatment

Excavation is a timely and effective means of remediation of impacted soil. This approach results in a reduction of COCs on-site, depending on the treatment or disposal method, can result in constituent destruction, recycling, or land-filling. Dependent upon the Site, COCs, and the level of COCs in the excavated material, both off-Site treatment, recycling or disposal and on-Site disposal may be options.

It can be implemented in the short to moderate term. For this approach to be practical and cost-effective, impacted soil must be accessible to excavation equipment. Other considerations include the proximity of the impacted soil relative to buildings and other structures, the depth of the impacted soil, the depth to groundwater, area available for staging/stockpiling, ability of current operations to accommodate disruption, health and safety aspects of the excavation, and cost relative to other feasible technologies.

An excavation plan should be prepared that addresses worker health and safety, including vapor and dust monitoring, if appropriate, waste characterization; erosion and sedimentation controls for the stockpiled materials and the excavation area; vehicle management and anti-tracking, as appropriate; dust-control measures; permits and operating hours; post-excavation sampling and analysis; and backfilling and site restoration.

The project Health & Safety Plan (HASP) should include, but not be limited to, identification of potential hazards, work methods to mitigate hazards, environmental monitoring measures, procedures for securing the site/open excavations, emergency-response procedures and emergency contacts, and worker training and medical monitoring.

Soil waste must be appropriately characterized prior to potential on-Site or off-site disposal. Existing data may be sufficient to identify the COCs, but representative samples of the waste may also need to be collected and analyzed for waste determination (hazardous vs. non-hazardous/Connecticut–regulated) and to satisfy the disposal facility or potential on-Site disposal permit requirements. In the case of off-Site disposal, the necessary waste characterization documentation must be completed and forwarded to the disposal facility prior to manifesting and off-site shipment of wastes. Transportation arrangements must be made with appropriately licensed haulers.

Staging of wastes on-site may require compliance with the terms of the General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer). Specific points of this permit may be triggered dependent upon the duration and volume of material staged. Permanent disposal of material on-Site would require permitting and prior approval from CTDEP.

Soil/material staging plans should address securing the materials from erosion and proper material labeling. Materials stored in covered containers do not pose the same risk of erosion as stockpiles, which must be covered and secured from the elements. Depending on the waste (hazardous vs. non-hazardous) there may be labeling, inspection, and recordkeeping requirements that should also be addressed in this plan.

Depending upon Site conditions and work methods, measures such as anti-tracking pads and decontamination areas may need to be implemented to avoid spreading of waste materials on-site and off-site through vehicle movement. Dust-control measures may also be necessary depending on the nature of the COCs and the potential for exposures.

A plan for post-excavation sampling should include descriptions of the sampling methods, frequency, analytical parameters and methods, sample nomenclature and handling, and compliance levels. Site restoration plans should describe the acceptable types of backfill, pre-acceptance testing or approvals for backfill material, compaction requirements, and paving or re-vegetation requirements.

If the impacted material is to be relocated on-Site, potential long-term monitoring and maintenance of the landfill area may be required. A plan should be prepared prior to relocating the material that addresses these concerns in accordance with the requirements of all necessary CTDEP permits and approvals.

Potential obstacles that may impact the extent of excavation activities include impacted soils located under buildings or other permanent structures.

Solidification/Stabilization

Using solidification/stabilization technologies the COCs in soils are rendered less leachable, although they remain in place. Solidification techniques utilize cement and other additives to alter the oxidation state of the metal (rendering it less soluble) then bind the soil; stabilization technologies reduce the solubility of metals through the addition of chemicals such as phosphates, mineral fertilizers, iron oxyhydroxides, etc. Total metals concentrations would be expected to remain relatively unchanged (except as might have occurred due to the increase in total mass caused by the addition of materials). Solidification/stabilization could be implemented in the short to moderate term, requiring up-front time for bench-scale testing and design.

In-situ solidification/stabilization may be used to address areas where soils do not comply with the GB PMC, but do comply with the DEC. If COCs in soils exceed both the GB PMC and the DEC, soils that do not comply with the DEC could be rendered `inaccessible' and the remaining soils that are not in compliance with the GB PMC could be addressed with solidification/stabilization techniques.

Consideration to the application of these technologies includes access, as many mixing technologies require access to the area by heavy equipment, either excavators or specialized augering/mixing equipment. Organics may interfere with the bonding process, and long-term stability may be an issue. Soil characteristics and depth of mixing must be within the capabilities of the equipment.

Given the moderate to high cost to apply this technology, the total cost with soil cover (for DEC compliance) would likely render this combined alternative as too costly for the Site activities planned.

Phytoremediation

Plants can be used to change soil chemistry, thereby reducing chemical mobility and absorb COCs from the soil and accumulate the COC in the plant tissue. Phytoextraction would be expected to reduce exposure risk by removal of COCs (into the plant biomass, which is then harvested and removed from the Site), and if effective, would be a long-term treatment technology that reduces levels of COCs. Phytostabilization may be effective in lowering leachable concentrations of COCs, but it may not be a suitable method for demonstrating compliance in areas where the DEC are exceeded as it does not result in a reduction of COCs in soil.

The consideration of phytoremediation as a remedial technology must include the following:

- Laboratory studies should be available that document the effectiveness of the selected vegetation varieties in remediating the target constituents in the target media.
- The target zone must be within the root zone of the plants or the COCs must be moved to within the root zone by plowing or tilling.
- The COCs should be within the range of tolerance of the vegetation otherwise growth may be inhibited.
- Bioaccumulation and the possible effects on other parts of the food chain should be evaluated.
- The biomass will have to be harvested and properly recycled or disposed of for chemical reduction to be accomplished.

This technology has not been retained as a stand-alone solution.

Soil Washing

Soil washing removes COCs from excavated soil, placing those constituents into the wash solution. The wash solution is then accumulated and treated using waste-water treatment technologies. As necessary, solids would be separated, dewatered, and disposed off-site. The process relies on particle-size separation (removal of fines) and/or chemical processes (such as leaching agents or pH adjustment). Once the transfer is completed, the washed soils or larger particles are returned to the site and the COCs are removed from the site. This technology can be accomplished on the short to moderate term. However, this technology reportedly has only limited commercial availability and may only be economical for large sites.

The table on the following page represents a summary of remedial technologies evaluated for the Site.

Summary of Remedial Technologies

Summary of Alternative Brownfields Clean-up Analysis

Technology	Implementability	Relative Cost	Retained/Comments
Do Nothing	Easy	None	Not a viable solution given the deteriorated condition of hazardous building materials, USTs, ASTs, and cinder fill material being exposed at grade surface.
Encapsulation of Hazardous Building Materials	Easy to moderate; but would eventually require abatement if window or pipe repairs were needed	Low to moderate	Not a viable solution given the deteriorated condition of hazardous materials and building components. Will not permanently delete the hazard.
Abatement of Hazardous Building Materials	Easy to moderate; will be conducted in conjunction with building renovations	Moderate to high	Yes. Eliminates the hazard permanently.
Institutional Controls	Relatively easy; need landowner and easement holder approvals	Low, but must be combined with another technology to achieve regulatory compliance	Not retained as a stand-alone approach
Engineered Controls	Easy in short term; long-term obligations	Moderate	Yes
Soil Cover	Easy to moderate	Low to moderate	Yes. Must be combined with another technology to address GB PMC.
In-Situ Bioremediation via bioventing	Easy to moderate; will create disruption if design requires treatment inside buildings	Low to moderate	Yes, however, it would most likely be used in very select circumstances and in conjunction with other remedial technologies.
Excavation with disposal or treatment	Easy to moderate; will create disruption, land filling may create loss of usable land	Moderate depends on waste classification(s)	Yes
Solidification/stabilization	Moderately difficult; specialized equipment needed; debris would likely be a problem	Moderate to high; would likely need to be combined with another approach to be completely effective	No
Phytoremediation	Easy for shallow soil; would require additional research and pilot tests; may not be easy to implement on deeper soil	Low	Not retained as a stand-alone solution. Won't work with subsurface petroleum impacts
Soil Washing	Limited availability	Moderate to high	No due to availability and cost

4

Proposed Remedial Activities

The remedial actions proposed include removal of USTs and ASTs, excavation and capping of cinder fill material along the east side of the building, removal/disposal of window systems containing asbestos caulking, glazing, and lead-based paint, and abatement of asbestos containing floor tile and pipe insulation in the eastern portion of the main building.

No groundwater remediation or post–remediation groundwater monitoring is planned as part of this remediation as VHB understands that this will be the responsibility of Unisys.

Hazardous Building Materials

The remedial action proposed includes removal and replacement of approximately 100 windows in the main building and if time and funding permit abatement of approximately 1,500 square feet of floor tile and 200 linear feet of pipe insulation. The means and methods for removal of these materials will be determined by a licensed Asbestos Management Planner. A licensed asbestos abatement contractor will be responsible for conducting abatement activities and a licensed asbestos project monitor will be retained to conduct periodic monitoring, post-abatement visual inspections, and air clearance sampling.

Notifications and Approvals

A written Asbestos Abatement plan will be submitted to the Connecticut Department of Public Health for approval prior to abatement of asbestos containing materials. Written notification must also be provided to DPH prior to the on-set of abatement activities.

A Quality Assurance Project Plan (QAPP) for air sampling activities that will be conducted during and following abatement activities will be submitted to EPA for approval prior to abatement activities.

Written approval from a licensed asbestos disposal facility will be obtained for disposal of hazardous building materials to be abated from the Site.

Basic Health & Safety Procedures

Health and safety of Site workers, transient Site visitors, and any potential receptors will be addressed utilizing the following measures:

- An Asbestos Abatement Plan will be developed that will define work zone conditions where personal protective equipment is required.
- The Asbestos Abatement Plan will require daily safety briefings and sign in sheets for personnel accountability.
- Containments and work areas will be protected from accidental entry.
- Containments and work areas will be maintained and protected during work, and non-work hours from unauthorized access, to the extent that is practical.

Site Access and Controls

The asbestos project monitor and asbestos abatement contractor will be responsible for acting as Site Health & Safety Officers for the project. The following General Safety Procedures shall be followed by all persons entering and/or working on the Site:

- No Contractor employee or sub-contractor may be allowed on-Site without the prior knowledge and consent of the Health & Safety Officers and review of the Contractors Health and Safety Procedures.
- There will be no activities conducted on-Site without sufficient backup personnel.
- All Contractor or sub-contractor personnel shall bring to the attention of the Health & Safety Officers any unsafe condition or practice associated with the Site activities that they are unable to correct themselves.
- There will be no smoking, eating, chewing gum, or drinking in the restricted areas identified by the Health & Safety Officers.
- Hands shall be thoroughly cleaned prior to smoking, eating or other activities outside the designated restricted areas.
- Site personnel must avoid unnecessary contamination (i.e., walking through known or suspected "hot" zones or contaminated media, kneeling or sitting on the ground, leaning against potentially contaminated materials or equipment).
- No visitors will be allowed access to restricted areas without the knowledge and consent of the Health & Safety Officer. All visitors will be required to be briefed on safety procedures and will be required to be escorted while on-Site.
- All work shall be conducted in accordance with state and federal regulations for hazardous building material abatement and disposal.

Additional on-Site controls with respect to asbestos containing materials are required for this project and will be outlined in the Asbestos Abatement Plan.

Abatement

A licensed Asbestos Management Planner will be retained to prepare an Asbestos Abatement Plan for the project and a licensed Asbestos Abatement Contractor will be retained to implement the Plan. Below is a basic description of the anticipated means and methods for the proposed abatement of windows, floor tile, and pipe insulation.

Windows

It is anticipated that the majority of windows can be removed from the exterior of the main building. Where feasible, windows will be removed intact or without extensive damage so that disturbance of asbestos containing caulking and glazing materials and lead-based paint is minimized. Poly sheeting will be placed on the ground beneath the work area to prevent debris from contacting soils below. In the event that some windows cannot be removed from the exterior and requires removal interior to the building, standard containment procedures and air-clearance sampling will apply.

Once removed, windows will be wrapped in poly sheeting and placed in a lined dumpster for off-site disposal at a licensed disposal facility. If feasible, metal window frames will be recycled. This will be determined by the Asbestos Management Planner and Abatement contractor and will depend on whether asbestos containing materials (i.e. caulking and glazing) can be effectively and efficiently removed from the metal frames.

Floor Tile and Pipe Insulation

The 1,500 square feet of black 9 x 9 floor tiles and 200 linear feet of pipe insulation to be abated are located in the eastern portion of the main building. This area is currently unoccupied and slated for renovation. The floor tile, associated mastic, and pipe insulation are assumed to contain asbestos based on previous sampling results for homogenous materials in other portions of the building. It is anticipated that full containment procedures will be required in the interior building areas to be abated.

On Site Material Handling

All asbestos containing materials will be handled in accordance with an approved Asbestos Abatement Plan as well as local, state, and federal regulations. During abatement activities, the licensed asbestos abatement contractor shall be responsible for controlling fugitive dust emissions with the use of wet methods, containments, and HEPA filtrations systems.

All asbestos containing materials that will be abated will be wrapped/bagged in the containment/work area and placed in lined dumpsters for off-site disposal at an approved facility. All equipment and materials used during abatement activities will be properly decontaminated or disposed as asbestos containing materials.

Dumpsters for disposing of asbestos containing materials will be lined with poly sheeting with at least a 6 millimeter thickness. The liner will be inspected to ensure it is intact and free of holes/tears. The dumpsters will be temporarily located on-Site in a secure location and will be adequately covered to prevent infiltration of precipitation. Proper labels and warning signs will be placed on the dumpsters and all materials being placed in the dumpsters will be properly bagged or wrapped.

The Contractor will be responsible for limiting public access to the dumpster area, taking appropriate measures to prevent unauthorized entry onto the dumpsters, and for ensuring the integrity of the dumpsters and work area, throughout the duration of the project. Appropriate control measures may be accomplished through the use signs, caution tape, chain link fencing, gates, or other measures.

Site Operations

Work Area Controls – The work areas shall be properly protected at the end of each operating day or at any time that the Site and/or work area is unattended by the contractor.

Dust Controls – the Contractor shall minimize dust emissions from the work area by ensuring that all necessary dust controls including wet methods, containments, HEPA filters, and other appropriate work practices are implemented and maintained at all times during periods of operation.

Access and Site Operations – The Contractor shall be responsible for limiting access to and in securing the work area. It is also the Contractors responsibility to ensure that Site tenants are allowed safe access to portions of the Site that are necessary for their daily business operations. This includes, but is not limited to; ensuring that motor vehicle access around the perimeter of the Site building is not disrupted.

Decontamination Procedures

The Contractor is responsible for ensuring all personnel, materials, and equipment are properly decontaminated before leaving the containment or work zone. The contractor will be responsible for establishing decontamination areas and implementing decontamination activities appropriate to industry standards for asbestos abatement.

Rinse waters generated during decontamination procedures are to be collected, filtered, and properly disposed in accordance with state and federal regulations for asbestos abatement.

Post Abatement Visual Inspection and Air Clearance Sampling

Following completion of abatement activities a licensed asbestos project monitor will be responsible for conducting post abatement visual inspections and air clearance sampling (where applicable). The post abatement visual inspections will be conducted for all areas where asbestos containing materials have been abated to ensure the materials have been properly abated and no visible debris remains. The air clearance sampling will be conducted interior to the building in areas where asbestos containing materials are abated.

If the project monitor determines during the post abatement visual inspection that debris exist and additional cleaning activities are required, the contractor will be responsible for completing cleaning activities.

It is anticipated that air clearance samples will be analyzed on-Site by the project monitor via Polarized Light Microscopy (PLM). If PLM results determine that asbestos fibers are present in sufficient numbers to warrant additional cleaning the contractor shall be responsible for completing cleaning activities. With this scenario additional air clearance sampling will be required.

The appropriate sample duplicates, blanks, and other Quality Assurance/Quality Control (QA/QC) procedures will be implemented during air clearance sampling.

Hazardous Building Material Disposal

The contractor will be responsible for obtaining acceptance of abated materials to an appropriate licensed disposal facility and arranging transport of materials to this facility. The transporter will be a licensed hauler and materials shipped off-Site will be managed under proper hazardous waste manifest procedures. The contractor will be responsible for maintaining and providing the Site owner with manifests for each waste shipment.

Hazardous Building Materials Abatement Report

The asbestos project monitor will be responsible for providing the property owner with a written Hazardous Building Material Abatement Report following completion of the project. The report will detail abatement activities and document results of visual inspections and air clearance sampling. Waste manifests for the project will be provided as an attachment to the report.

Cinder Fill and UST/AST Removal

The remedial action proposed includes excavation of cinder fill material from 0-2 feet below grade along the eastern side of the building and removal of existing AST and USTs at the Site. If time and funding permit, petroleum impacted soils (if encountered) may be excavated, stockpiled, and disposed off-site.

The aerial extent of the excavation will be approximately 8,000 square feet. The excavated material will be live loaded for transport off-site to an approved licensed disposal facility. The excavated area will then be backfilled with two (2) feet of clean fill material and capped with a minimum of three (3) inches of bituminous pavement.

Permits and Approvals

The following discussion relates to permits, approvals, and notifications that may be associated with proposed remedial activities.

- State and Local Permits

There is potential that a local wetlands approval/permit may be required for any excavation activities occurring within the 100-foot wetlands buffer. If required, this approval/permit will be obtained prior to the initiation of excavation activities.

The entire Site is considered within the 100-year flood plain for the Mattabesset River, however, less than 100 cubic yards of petroleum impacted soils is expected to be generated during these remedial activities and therefore, a Flood Management Certification and General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) do not appear warranted for this project.

- Call Before You Dig

Prior to conducting remedial activities, VHB or the selected remedial contractor will contact Call-Before-You-Dig (CBYD) to have underground utilities marked out (as required by law) at the Site. VHB will coordinate Site access with the City, tenants, and other project stakeholders.

VHB understands that Unisys recently completed a detailed utility survey at the Site. VHB will work to obtain access to these as-built drawings to be used to identify potential utility conflicts with the remediation areas.

- Notifications

Public Notice of the remediation will be completed pursuant to USEPA and CTDEP requirements. It is anticipated that public notice of remediation at the Site will be completed in accordance with the scheduled tank removal project. The tank removal project is expected to be completed prior to remediation of the cinder fill area.

Basic Health & Safety Procedures

Health and safety of Site workers, transient Site visitors, and any potential receptors will be addressed utilizing the following measures:

- A Site Health and Safety Plan will be developed that will define work zone conditions where additional personal protective equipment may be needed.
- The Site Health and Safety Plan will require daily safety briefings and sign in sheets for personnel accountability.
- Open excavations will be protected from accidental entry.
- Site work and excavations will be protected during work, and non-work hours from unauthorized access, to the extent that is practical.

Site Access and Controls

The environmental field scientist or project manager and the general site Contractor will identify a Site Health & Safety Officer prior to the initiation of field activities. The following General Safety Procedures shall be followed by all persons entering and/or working on the Site:

- No Contractor employee or sub-contractor may be allowed on-Site without the prior knowledge and consent of the Health & Safety Officer and review of the Contractors Health and Safety Procedures.
- There will be no activities conducted on-Site without sufficient backup personnel.
- All Contractor or sub-contractor personnel shall bring to the attention of the Health & Safety Officer any unsafe condition or practice associated with the Site activities that they are unable to correct themselves.
- There will be no smoking, eating, chewing gum, or drinking in the restricted areas identified by the Health & Safety Officer.
- Hands shall be thoroughly cleaned prior to smoking, eating or other activities outside the designated restricted areas.
- Site personnel must avoid unnecessary contamination (i.e., walking through known or suspected "hot" zones or contaminated media, kneeling or sitting on the ground, leaning against potentially contaminated barrels or equipment).
- No visitors will be allowed access to restricted areas without the knowledge and consent of the Health & Safety Officer. All visitors will be required to be briefed on safety procedures and will be required to be escorted while on-Site.
- All work shall be conducted in accordance with 29 CFR 1910 OSHA Standards for General Construction and 29 CFR 1926 Safety and Health Regulations for Construction.

The Contractor will be responsible for providing appropriate signage with regard to restricted areas and Site access.

Soil Excavation

The excavation of the cinder fill material will be completed under the direction of a field scientist or project manager. Based upon available analytical data it appears that less than 1,000 CY of material will be excavated. The actual areas and volumes will be dictated by field conditions and the results of post-excavation confirmatory samples.

Refuse material, bulky materials, and/or metal, if encountered, will be separated, staged, and transported off-site for disposal or recycling. Additional soil handling details and procedures are provided in the On-Site Soil Handling/Stockpile section of this Work Plan.

If groundwater monitoring wells are encountered within the proposed excavation areas, every attempt will be made where practical to save these wells for future sampling. Hand digging around these wells and any utilities encountered may be required.

Soil conditions will be monitored based upon physical characteristics (visual, odor) and by utilizing a handheld photoionization detector (PID). Potential undermining of sidewalks, remaining roadways, or utilities will be monitored and excavation will be discontinued if unsafe conditions exist.

On Site Soil Handling / Stockpiles

During excavation activities in the designated construction areas the Contractor shall, at all times, take reasonable precautions to control fugitive dust emissions and odors.

Temporary on-site stockpiling of soils may be required to increase efficiency of truck access/egress, loading, and to reduce idle time. No more than 100 cubic yards of soils may be stockpiled at one time and stock piles must be located outside the 50-foot wetland buffer for the Site.

The stockpile area will be lined with polyethylene plastic sheeting (with a minimum thickness of 6-mil) underlayment. Sand bags (with a minimum weight of 30 pounds) should be used to secure the polyethylene sheeting. The stockpile area must be cleared of any debris that may result in damage to the polyethylene sheeting underlayment.

Temporary stockpiles must be covered by polyethylene sheeting (with a minimum thickness of 6-mil) at all times throughout the duration of the project to prevent precipitation from reaching soils, and to minimize potential exposures. The appropriate sedimentation, erosion, dust, and anti-tracking controls must be installed around the stockpiles in accordance with federal, state, and local regulations to prevent migration of

contaminated soils. If stockpiling is required it shall be the Contractor's responsibility to secure the stockpile and excavation area.

The Contractor will be responsible for limiting public access to these stockpiles, taking appropriate measures to prevent unauthorized entry onto the stockpiles, and for ensuring the integrity of the stockpiles and associated engineering controls, throughout the duration of the project. Appropriate control measures may be accomplished through the use of fences, gates, or other natural or artificial barriers.

Site Operations

Erosion Controls – Soil stockpiles shall be properly protected at the end of each operating day or at any time that the Site and/or stockpile area is unattended by the contractor.

Dust Controls – the Contractor shall minimize wind erosion and dust transport from the stockpiles, excavation, and on-site travel areas by ensuring that all necessary dust controls (tarps, dust suppressants, routine street sweeping, etc.) are implemented and maintained at all times during periods of operation.

Anti-tracking – The Contractor shall employ anti-tracking measures (street sweepers, anti-tracking pads, etc.) to ensure that vehicles that have entered the Site do not track soils onto a public roadway at any time. Construction entrance anti-tracking pads shall be constructed in a manner that is consistent with applicable state or local regulation.

Transporter Practices – The Contractor shall be instructed to utilize best management practices for the transportation of contaminated soil (minimize moisture content, proper tarping of hauling dump bodies, removing loose material from dump body, etc.).

Inspections of the soil erosion and sediment controls will be completed by the Contractor after each storm and daily during periods of heavy use. Repairs will be completed daily during periods of heavy use, immediately upon discovery if perimeter erosion controls are breached, and prior to the next rain for minor repairs or routine maintenance.

Access and Site Operations – The Contractor shall be responsible for limiting access to and in securing the work area. It is also the Contractors responsibility to ensure that Site tenants are allowed safe access to portions of the Site that are necessary for their daily business operations. This includes, but is not limited to; ensuring that motor vehicle access around the perimeter of the Site building is not disrupted.

Post Excavation Soil Screening and Sampling

The extent of excavation will be determined based on field observations and previous sample results. Undisturbed soil samples will be collected and field screened utilizing a

PID. Soil samples will be collected by hand utilizing a trowel, drain spade, or dedicated laboratory supplied container. Samples will be collected and placed directly into laboratory containers. Between sampling points, sampling tools will be cleaned using a laboratory grade detergent solution and rinsed with potable water.

Post excavation soil samples will be collected from the final excavation sides and bottom for laboratory analysis. Samples will be collected in accordance with CTDEP guidelines. It shall be the Contractor's responsibility to secure the work area while awaiting analytical results. This is to include securing the stockpiles and potential open excavation areas. Dependent upon analytical results additional excavation may be required.

Soil samples from the excavation area will be analyzed for COCs as outlined in the previous section of this report. The total number of post-excavation samples will be dictated by the overall dimensions of the excavation area. Samples will be collected in accordance with CTDEP guidance which recommends samples be collected approximately every twenty (20) feet along the sidewall and excavation bottom. CTDEP Reasonable Confidence Protocols will be followed regarding sample duplicates, blanks, and other Quality Assurance/Quality Control (QA/QC) procedures.

Soil Disposal

Excavated cinder fill material is expected to be live loaded and transported off-Site for disposal at an approved licensed facility. Petroleum impacted soils that are excavated will be stockpiled and sampled for waste characterization purposes to determine disposal options for this material. VHB will collect the appropriate number of samples from stockpiled material for waste characterization purposes. If waste characterization sampling determines that off-Site disposal is necessary, analytical results will be provided to the Contractor along with a sample location map for the purposes of obtaining acceptance to dispose the impacted soils at a licensed disposal/treatment facility.

All soil that is transported off site will be managed under a waste manifest or Bill of Lading. Each shipment will be logged and tracked to confirm that it is received and properly disposed at the facility.

Decontamination Procedures

The Contractor is responsible for ensuring all personnel and equipment leaving the work zone shall be thoroughly decontaminated in accordance with CFR 29 1910.120(k). The contractor will be responsible for establishing a decontamination area for personnel and equipment and implementing decontamination activities appropriate to field conditions, known exposure potentials, and level of worker protections.

The personnel decontamination procedure for Level D requires the disposal of gloves, tyveks (if used), and boot covers (if used) in plastic lined containers on-Site. All non-disposable equipment used on-Site that becomes contaminated will be cleaned by the protocol referenced above.

The decontamination procedures to be utilized for heavy equipment will at a minimum consist of the following process:

- Remove residual soils from equipment in work zone before moving to decontamination area.
- Inspect equipment to ensure all visible dust has been removed.
- Rinse heavy equipment with potable water in decontamination area.

Sediment/sludge and rinse waters generated during decontamination procedures are to be collected for characterization and proper disposal.

Remediation Report

A report describing the Remedial Action Outcome will be completed, including site plans illustrating sample locations and results. The report will include final volumes of soil excavated, post-excavation confirmatory sampling results, QA/QC, waste characterization sampling, soil disposal documentation, hazardous building materials abated, and other pertinent details. The aforementioned Hazardous Building Materials Report will be included as an attachment to the Remedial Action Outcome Report.

Figures

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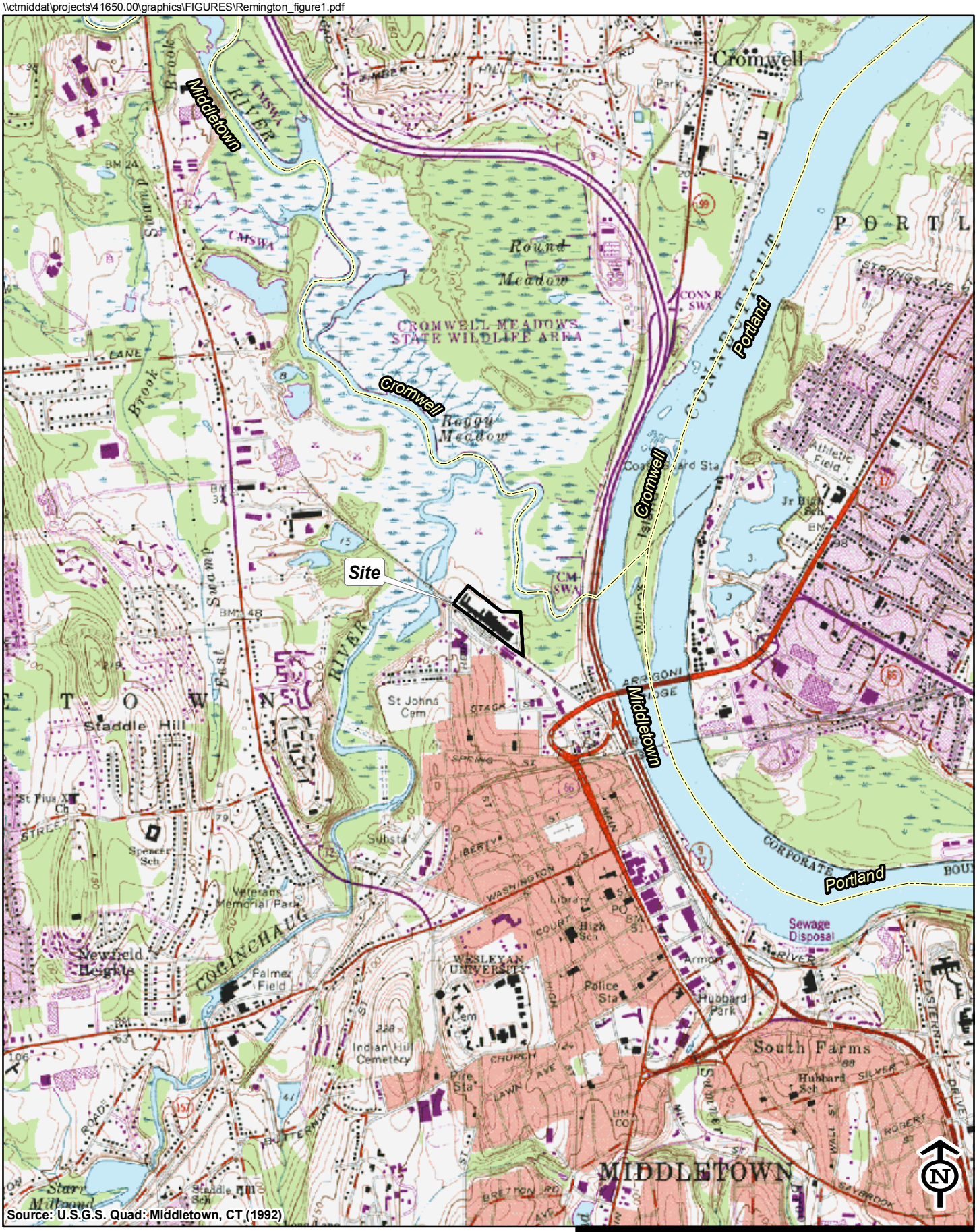

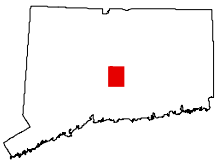

Quadrangle Location

1,000 500 0 1,000 Feet

Vanasse Hangen Brustlin, Inc.

Figure 1
Site Location Map
Remington Rand
180 Johnson Street
Middletown, Connecticut

J:\41650.00\graphics\FIGURES\Remington_Proposed_Remediation_Area.pdf

Legend

- Cinder Fill Remediation Area
- Aboveground Storage Tank (AST)
- Underground Storage Tank (UST)
- Middletown Parcels (Dec 2009)

Figure 2
Proposed Remediation Area Map

180 Johnson Street
Middletown, Connecticut

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100 50 0 100 Feet

Vanasse Hangen Brustlin, Inc.

Appendix A
Limitations

- This report has been prepared for the sole and exclusive use of the City of Middletown (Client) and is subject to and issued in connection with the Agreement and the provisions thereof. Any use or reliance upon information provided in this report, without the specific written authorization of Client and VHB, shall be at User's sole risk.

- In preparing this document, VHB has obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property. Except as otherwise noted, no attempt has been made to verify the accuracy or completeness of such information.

- The objective of this remedial action plan is to remove existing ASTs and USTs documented at the Site.

- The information presented in this report is based solely upon information gathered to date. Should further environmental or other relevant information be developed at a later date, Client should bring the information to the attention of VHB as soon as possible. Based upon an evaluation, VHB may modify the report and its conclusions.

- This remedial action plan has been prepared in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.