July 22, 2014

Ref: 57634.00

Mr. Hugo Martinez Cazon
Vermont Department of Environmental Conservation
Waste Management & Prevention Division
1 National Life Drive, Main 2
Montpelier, VT 05620-3522
hugo.martinezcazon@state.vt.us

Re: Burlington Waterfront Improvements and Bike Path Rehabilitation Phase 1(a)
Soil Management Plan

Dear Hugo,

Enclosed please find the Soil Management Plan ("SMP") for the initial phase of construction for the Waterfront Park Improvements Project and the Burlington Bike Path Rehabilitation Project. During this phase, work on the Bike Path will occur between Perkins Pier and Penny Lane only. Since the overall Bike Path Rehabilitation Project is much longer than this segment, soils management for separate phases of the overall project will be addressed under a separate SMP or as an addendum to this SMP. This plan is being submitted to you for your records, and has been revised from the prior draft to incorporate your suggested revisions.

Please feel welcome to call me with any questions.

Sincerely,
VANASSE HANGEN BRUSTLIN, INC.

R. L.

Rachel Lomonaco
Environmental Scientist

Enclosure
cc: Jen Francis, City of Burlington, Parks, Recreation & Waterfront
Jesse Bridges, City of Burlington, Parks, Recreation & Waterfront
Kirsten Merriman Shapiro, City of Burlington, CEDO
Betsy Catlin, Dunkiel Sanders Elliott Raubvogel & Hand

F:\57634.00\reports\OHM Reports\Contingency Plans\Coverletter.doc

Vanasse Hangen Brustlin, Inc.
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North Ferrisburgh, Vermont 05473
802.497.6100 ▪ FAX 802.425.7799
www.vhb.com

Soil Management Plan

BURLINGTON WATERFRONT PARK IMPROVEMENTS AND BIKE PATH REHABILITATION PHASE 1(a) PROJECT

Burlington, Vermont

Prepared for **City of Burlington**
Parks, Recreation & Waterfront
c/o Jesse Bridges
645 Pine Street, Suite B
Burlington, Vermont 05401

Prepared by **Vanasse Hangen Brustlin, Inc.**
Environmental | Transportation | Land Development Services
7056 US Route 7
P.O. Box 120
North Ferrisburgh, Vermont 05473

July 22, 2014

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1.0 Introduction and Scope of Work

Vanasse Hangen Brustlin, Inc. ("VHB") is working with the City of Burlington's Department of Parks, Recreation & Waterfront ("PRW") on the Waterfront Park Improvements Project and the Burlington Bike Path ("BBP") Rehabilitation Project. This Soil Management Plan ("SMP") will apply to the initial phase of the BBP Project (as described more specifically in the following paragraph) as well as to the Bike Path and non-Bike Path-related improvements in Waterfront Park. The term "Project" as used herein will refer to these two separate, but adjacent City projects. Construction of these projects is anticipated to occur in the Fall 2014 construction season. The Project will involve minor amounts of earthwork during the preliminary information collection phases and during construction phases. VHB has prepared this SMP to outline the general procedures that the City's contractors or subcontractors shall follow during all phases of the Project that involve the potential handling of contaminated soil within the Project Area. This SMP is structured so that general procedures are outlined and described in Section 2.0, and site-specific descriptions, potential concerns, and management practices are described in Section 3.0.

The total BBP Project Area consists of an 8-mile stretch of paved pedestrian and bicycle path located along the Lake Champlain waterfront of Burlington, Vermont. For ease of reference, the BBP has been divided into 17 Sections (0-16), with Section 0 located along the southernmost section of the path, and Section 16 located in the northernmost section of the path (see map on page 1 of Appendix 1). During the 2014 construction period, work will be carried out from Perkins Pier through Penny Lane (Section 5 through Section 8), which is being referred to as Phase 1(a) of the BBP Rehabilitation Project. Therefore, this SMP addresses only these three Sections. Section 9 of the BBP work is being carried out separately, as part of the City's Waterfront Access North project, which is governed by a separate SMP and Corrective Action Plan. BBP Project Areas located to the north of Waterfront Access North (Sections 10 to 16) and to the south of Perkins Pier (Sections 0 to 4) will be addressed under one or more separate SMPs or addendums to this SMP, which will be generated in the future. Overview maps of the Project Area are included on pages 1 through 2 of Appendix 1 and detailed Project Area Maps are included on pages 3 through 5 of Appendix 1.

As directed by the State of Vermont, PRW and its subcontractors shall follow the procedures outlined herein. Subcontractors are responsible for establishing and following the Subcontractor's Site Specific Health and Safety Plans.

2.0 General Contingency Plan

Based on the waterfront's industrial history, known presence of oil and hazardous material contamination in site soils, and high potential for contamination to be encountered during Project construction, OSHA-HAZWOPER certified personnel shall perform work related to handling, screening, or sampling excavated soils. The subcontractor completing earthwork shall mark out excavation locations and notify Dig Safe (1800-DIG-SAFE) at least 48 hours prior to start of work.

The DEC Waste Management Division ("WMD") shall also be notified prior to work along the BBP or within Waterfront Park. The primary Sites Management Section ("SMS") contact is:

Hugo Martinez-Cazon, PE
VT DEC Sites Management Section
802-522-5564
Hugo.MartinezCazon@state.vt.us

Refer to Section 3 for other site specific Site Manager's contact information if Mr. Martinez-Cazon cannot be reached.

Additional contact information for the reporting of contamination is included below:

Vermont WMD Spills Hotline:	1-800-641-5505 802-828-1138
National Response Center:	1-800-424-8802

2.1 Proposed Construction Phase

Project construction will generally consist of pavement reclamation, resurfacing, reconstruction, and new construction, as well as utility upgrades or relocation.

The following are descriptions of the proposed methods for work related to rehabilitation of the BBP:

1. Resurfacing consists of grading and compacting existing sand and gravel surfaces prior to paving in areas of proposed BBP realignment.

2. Reconstruction consists of excavating the existing materials to an 18 inch depth followed by grading and compacting the subgrade. Nine inches of excess, reclaimed asphalt/aggregate or new dense graded crushed stone would be placed and compacted to a depth of nine inches over the compacted subgrade. Two layers of asphalt, totaling 3 inches in depth, would be placed over the new base course. Shoulders will be constructed two feet wide on each side of the paved path where possible by adding 4 inches of aggregate surface course over the new base course rather than asphalt.

3. New construction will be in areas of new path alignment or slight realignments. This will involve excavating the soils to an 18 inch depth followed by grading and compacting the subgrade. Nine inches of excess, reclaimed asphalt/aggregate or new dense graded crushed stone would be placed and compacted to a depth of nine inches over the compacted subgrade. Two layers of asphalt, totaling 3 inches in depth, would be placed over the new base course. Shoulders will be constructed two feet wide on each side of the paved path where possible by adding 4 inches of aggregate surface course over the new base course rather than asphalt.

4. Removal will involve excavation of the existing materials to a 12 inch depth, followed by grading and compacting the subgrade. Clean topsoil will be placed over the compacted subgrade, which will be seeded and hayed.

Utility relocation within Waterfront Park will include the following:

1. Power access will be upgraded and redistributed through new power bollards along the east side of the park, which will require shallow (1 to 2 foot deep) trenches. Installation of a new power cabinet will be included on the south end of the event grounds, which will also require shallow excavation.

2. Potable water access will be upgraded through the installation of service connections through bollards. Additionally, an approximately 20 foot extension of the existing water line is being proposed. These upgrades would involve discrete excavations to access the water line at points of bollard installation to a depth of approximately 4 to 6 feet deep. An approximate 6- foot deep by 20- foot long trench will be excavated to install the water line extension.

3. Stormwater Infrastructure: Pervious grass pavers will be installed along the western side of the realigned Bike Path within the Event Grounds to improve access to the area by event construction and support vehicles. The width will be sufficient to allow for both vehicle parking and unencumbered access for emergency vehicles during the event. The installation of the pavers, and the path's construction would likely require a net addition of material to accommodate the required slope. Excavation of soil for installation of the grass pavers would be limited to the top few feet of existing fill material, and excess soil may be used to create the slope required for the BBP.

4. Lighting Fixtures and Other Waterfront Park Improvements: Additional Waterfront Park improvements may consist of replacing light fixtures and replacing the boardwalk along the waterfront. These improvements will involve minor amounts of excavation, generally 1 to 2 feet deep.

With respect to excavation within the Project Areas, VHB and the excavation contractor will:

1. Review site specific Corrective Action Plans ("CAPs") and Soil Management Plans for the area of the BBP where work is to occur, if applicable.

2. Notify the appropriate DEC WMD personnel prior to commencing work in areas subject to a CAP or SMP.

3. Arrange for an OSHA-HAZWOPER certified scientist (40-hr certification) to be present during excavations to screen soils and ambient air for Volatile Organic Compounds ("VOCs"). Any personnel handling or being exposed to the soils must be OSHA-HAZWOPER certified.

4. Consult the Health and Safety Plan to determine maximum acceptable exposure levels. In general, work should stop if photoionization detector ("PID") values in the exclusion zone work area reach or exceed 1,000 ppm.

2.2 Field Methods - Quality Control/Quality Assurance

Soil screening and observations will be conducted by an OSHA-HAZWOPER certified scientist trained and experienced with contaminated soil and use of a PID. Each day, the PID will be calibrated on-site relative to a 100 ppm isobutylene standard, per manufacturing instructions, and calibrations will be recorded in the instrument's calibration log.

2.2.1 Excavation Monitoring

During excavations, ambient airspace will be continually monitored with a PID for health and safety purposes as well as acquiring a background ambient air reading. The ambient air reading will be collected away from overt sources of VOCs including but not limited to; excavation equipment, construction materials and indelible markers.

In areas with no evidence of gross contamination or of suspected contamination, approximately 10% of soil being disturbed will be subject to field screening within the bucket of the excavator. In areas of suspected contamination or with visual and olfactory evidence of contamination (see Oil and Hazardous Materials Series maps in Appendix 1, and summary tables in Appendix 2), each excavator bucket will be screened with a PID. Screening of each excavator bucket of soils is recommended in

these areas due to the potential for public exposure on the completed Project, and the complex history and mix of contaminants at the site.

Screening will consist of creating a narrow linear depression in the soil contained within the excavator bucket with a clean implement or a clean nitrile gloved hand. The PID probe will be inserted into and moved along the depression for a continuous headspace reading while a clean nitrile gloved hand is cupped over the top of the depression and moved along with the PID probe. The most elevated reading will be recorded along with soil characteristics including; depth, lateral location, time of screening, maximum PID reading, color, texture, moisture content and olfactory observation. Areas of elevated PID screen readings (>10 ppm above the ambient background reading) or visual/olfactory evidence of contamination will be collected for headspace measurements. Refer to VHB's PID Field Screening Standard Operating Procedure ("SOP") in Appendix 3 for detailed procedures that will be followed.

The DEC shall be notified if soil PID headspace levels reach or exceed 100 ppm or if overt evidence of contaminated soil is encountered. Detailed notes indicating the approximate volume of material removed and PID values will be recorded on daily observation logs.

If groundwater is encountered during excavation, the depth of groundwater seeps and lateral location will be recorded. In addition, groundwater will be inspected for visual and olfactory evidence of contamination. Observation notes will be recorded and the VT DEC will be notified if any overt evidence of contamination is encountered.

2.2.2 Soil Management

Excavated soil will be managed by sorting contaminated soil (PID value > 10 ppm over the ambient background value, or soil with visual or olfactory evidence of contamination) from clean soil by using PID field screening and headspace readings. The excavated materials will be temporarily stored in separate roll-off containers. Roll-off containers used for the storage of contaminated soil shall be lined with 6 mils thick polyethylene plastic ("plastic"), and covered with polyethylene plastic at the end of each day. Roll-offs shall have a lid to prevent precipitation from entering

the container. Containers used for clean soil need not be lined with plastic. Alternatively, if space does not permit the use of roll-off compartments within or in close proximity to the work area, soil may be temporarily stockpiled and encased within plastic sheeting to control runoff, next to the excavation area. The stockpiled soils will be appropriately placarded to limit public access and provide and expected removal date.

All utility excavations proposed for Waterfront Park (see Section 2.1) will be backfilled with clean soil, sourced from off-site, to alleviate worker exposure, if utility work is required in the future. The excess soils produced from the utility excavations can be reused as fill in other areas of Waterfront Park if it is not considered contaminated (<10 ppm PID reading) and it is capped by either bituminous pavement or at least 6 inches of clean backfill and seeded.

In other areas, contaminated soil should be preferentially backfilled as close to the source area as possible but will be capped by either at least 6 inches of clean top soil with seeding and mulching, or bituminous pavement. Circumstances in which contaminated soil may not be backfilled could include the presence of debris or soil types that are unsuitable for project geotechnical needs, excess volume of excavated soil relative to the amount of fill that can be accommodated, or levels of contaminants that exceed VT DEC guidelines for backfilling (to be determined on a case-by case basis through discussion with the VT DEC following discovery of soils with PID readings over 100 ppm and/or of soils saturated with free product petroleum).

Contaminated soil that cannot be backfilled will initially be temporarily stored in properly labeled roll-off containers, a poly encapsulated soil pile, or transferred to properly labeled 55-gallon metal drums (if of a sufficiently small quantity) until disposal methods are determined based on confirmatory sampling (see Section 2.2.2). The stockpiled soils will be appropriately placarded to limit public access and constructed to control runoff.

2.2.3 Groundwater Management

Given the shallow water table (3 to 5 feet below ground surface) in the Project area there is a possibility that groundwater will be encountered during the deeper

excavations (6 feet below ground surface) required for utility upgrades within Waterfront Park. Given that the impacts to groundwater in this area are considered minor and not currently governed by a CAP or a notice to the land records, it is anticipated that the groundwater encountered will not require special management. If dewatering is required for utility upgrades, the purged water will be pumped and contained within a frac tank or 55-gallon metal drums (if of a sufficiently small quantity). The purged water will be characterized for contaminants of concern and, pending VT DEC approval, will be returned to the same general area from where it was pumped (lateral and depth) after completion of the utility upgrade. If VT DEC approval is not granted, then other water disposal options will be coordinated with the appropriate VT DEC manager. Other options may include trucking the water to the Burlington wastewater treatment plant, if acceptable to the plant operator, and/or pre-treating the water via carbon filtration or air stripping.

2.2.4 Soil Sampling Prior to Disposal

If possible, stockpiled contaminated soils that cannot be backfilled on-site will be preferentially disposed of at an accepting landfill as alternate daily cover (if acceptable based on confirmatory sampling), treated via stockpiling at the Project site, or will be shipped to ESMI of New Hampshire as hazardous waste (if necessary based on the sampling results). Until a final off-site disposal location can be confirmed, the soils will be temporarily stored in plastic-lined roll-off containers, in a plastic-lined soil stockpile, or in sealed metal 55-gallon drums, and will be properly labeled and constructed. Representative soil samples will be collected and analyzed for constituents as instructed by the accepting disposal facility. Soil sampling will occur in accordance with VHB's Soil Sample Collection SOP included in Appendix 3. Soil screening, sampling, and disposal will be coordinated with the appropriate VT DEC manager, and manifested in accordance with the Vermont Hazardous Waste Management Regulations[1].

If the City wishes to treat contaminated soils via stockpiling at the Project site, it will seek approval for a specific stockpile location from the SMS prior to constructing a long-term stockpile. Soils will remain in temporary plastic-lined roll-off containers until approval by the SMS. Stockpile configuration and location will be designed in

[1] Hazardous Waste Management Regulations, State of Vermont Agency of Natural Resources, March 15, 2013.

accordance with the Investigation and Remediation of Contaminated Properties[2] standards for Off-Site Polyencapsulation. The number of representative soil samples that should be collected to determine the contaminant profile of the soil stockpile are summarized in Table 1. Analyses will be determined based on field observations, location of contamination, and site history. Anticipated analyses are discussed in Section 3.0 and provided in the Table on page 1 of Appendix 2.

Table 1: Number of Representative Soil Samples to be collected for Laboratory Analysis*

Volume of Soil	Minimum # of Discrete Samples
Not exceeding 50 cubic yards	2
Not exceeding 100 cubic yards	3
Not exceeding 200 cubic yards	4
Each additional 100 cubic yards	4 plus 1 sample/100 cubic yards

*Based on the DEC's IROCP's guidelines for thin-spreading soils off-site (Section 3.1.5).

3.0 Area-Specific Soil Management Plans

This portion of the SMP serves to provide area-specific information for informing workers and planning for the potential encounters with hazardous materials.

Prior to preparing this SMP, VHB completed a desktop screening of documented HWS in close proximity to the BBP and Waterfront Park. The HWSs, their approximate extent of contamination, as determined from DEC document reviews, and the potential risk of encountering contamination are depicted on the maps on pages 4 through 5 of Appendix 1, and summarized in tables within Appendix 2. A Soil Management Matrix Table is included on page 1 of Appendix 2 for quick reference of Section-specific information.

[2] Investigation and Remediation of Contaminated Properties Procedure, State of Vermont Agency of natural Resources, April 2012.

3.1 Section 5 (Perkins Pier to Maple Street)

Description: Section 5 begins at the northwest corner of the Burlington Wastewater Treatment Facility. The path travels east and borders the northern part of treatment facility, and then turns to the north, paralleling the railway to Maple Street.

DEC Contact Person(s):

Hugo Martinez-Cazon (Primary)	Michael Smith
802-522-5564	802-249-5826
Hugo.MartinezCazon@state.vt.us	Michael.B.Smith@state.vt.us

Nearby HWSs: VHB did not identify any documented releases of hazardous waste that would have likely resulted in contamination within this area of the BBP corridor.

Potential Contaminants: Contaminants related to historic industrial use of the waterfront, such as PAHs, petroleum compounds, and metals may be encountered in the portion of the path that borders the railroad.

Area-Specific Soil Management Notes: Soil will be screened and managed as outlined in Section 2.0. If contamination is encountered during any earthwork activities, the DEC will be notified as soon as possible.

3.2 Sections 6 (Maple Street to King Street) and Section 7 (King Street to College Street)

Description: Section 6 begins at the Maple Street and ends at King Street where it crosses the railroad. Section 7 begins at King Street and ends at College Street. The area around these BBP sections is primarily commercial and industrial.

DEC Contact Person (notify prior to any work in this area):

Hugo Martinez-Cazon (Primary)	Matthew Becker
802-522-5564	802-249-5770
Hugo.MartinezCazon@state.vt.us	Matthew.Becker@state.vt.us

Nearby HWSs: 151 South Champlain Street, SMS#20033098; located approximately 600 feet east from the Project Area.

151 South Champlain Street site is an active HWS due to the presence of chlorinated solvents (tetrachloroethene ("PCE") and trichloroethene ("TCE")) in the shallow subsurface soils and groundwater. The main building was formerly used as a laundromat (Park Cleaners) in the late 1950s and is considered the likely source of contamination. A second former on-site building was historically used as an automobile repair facility. Chlorinated contamination in shallow groundwater is localized near the western edge of the main building and extends westward, in concurrence with groundwater flow, to Lake Champlain. According to historic reports, groundwater concentrations near the Project Area (MW-112 and MW-113) have historically exceeded regulatory standards for PCE and TCE. In addition, indoor air quality in the site building and several off-site buildings indicates the presence of PCE at concentrations above the regulatory standards for residential occupation. A Notice to the Land Records was filed on March 14, 2008 for soils and groundwater impacted at less than 5 feet below grade for the railroad right-of-way and the BBP property. No excavation can be performed in this area without prior notification of the VTDEC.

Potential Contaminants: PCE, TCE, petroleum compounds

Area-Specific Soil Management Notes: A Notice to the Land Records was filed for this area of the BBP, which indicates that no excavation can be performed without prior notification of the VT DEC.

VHB anticipates that contaminated materials will be encountered in this area. Work should proceed with caution and excavated soils shall be managed in accordance with the 2008 Revised Corrective Action Plan for this site.

During excavation, soil will be screened as outlined in Section 2.0. If contamination is encountered during any earthwork activities, the DEC will be notified as soon as possible. Soil with PCE and TCE contamination may not be suitable for treatment through stockpiling, so storage and arrangements for disposal at an appropriate disposal facility would be necessary.

3.3 Section 8 (Waterfront Park)

Description: Section 8 begins at the intersection of Main Street and continues through Waterfront Park to Penny Lane. The BBP is to be realigned in this area by relocating the diagonal portion of path that currently bisects the main lawn (Event Grounds) to the eastern perimeter of the park along the existing railroad right-of-way. Utility work, including electrical power upgrades, a new water service lines and a drivable grass access/egress way are also planned for this area.

DEC Contact Person(s):

Hugo Martinez-Cazon (Primary)	Richard Spiese
802-522-5564	802-249-5083
Hugo.MartinezCazon@state.vt.us	Richard.Spiese@state.vt.us

Nearby HWS: The closed Central Vermont Railroad and Alden Waterfront, SMS#870005 is situated within the Project Area.

A portion of the Waterfront Park was constructed by filling in the Lake in the 1850's and 1860's when the first railroad tracks were installed[3]. Historic industrial land uses consisted of lumber storage and transfer, oil storage, and scrap yards. Railroads, barges and trucks transported various petroleum products to and from the waterfront area. Industrial and commercial activities at the Waterfront Park ceased in 1979. Environmental investigations conducted in the late 1970's and early 1980's found residual petroleum contamination in the soil in the vicinity of the fuel storage area and in the salvage yard area[4]. Additional investigations were completed in the late 1980's and early 1990's (reports not available), and site contamination was mitigated by placing fill over the contaminated soils to prevent public contact[5]. Due to this previously placed fill, the risk of encountering contamination during Project construction as a result of the documented historic use of this area is mitigated, except in localized areas of deeper excavations for water utility upgrades.

Potential Contaminants: Petroleum, PAH soil beneath fill

[3] Weston Inc. On-Shore and Off-Shore Subsurface Investigation of the Central Vermont Railway-Option Property, Burlington, Vermont. April 25, 1986.
[4] Weston Inc. On-Shore and Off-Shore Subsurface Investigation of the Central Vermont Railway-Option Property, Burlington, Vermont. April 25, 1986.
[5] Per communication with Richard Spiese on November 25, 2013.

Area-Specific Soil Management Notes: Excavation work should proceed with caution in this area. Soil will be screened and managed as outlined in Section 2.0. If contamination is encountered during any earthwork activities, the DEC will be notified as soon as possible.

APPENDIX 1



Legend

Approx. Bike Path Centerline

City of Burlington
Bike Path Rehabilitation
Burlington, Vermont
Site Location Map

August 29, 2013

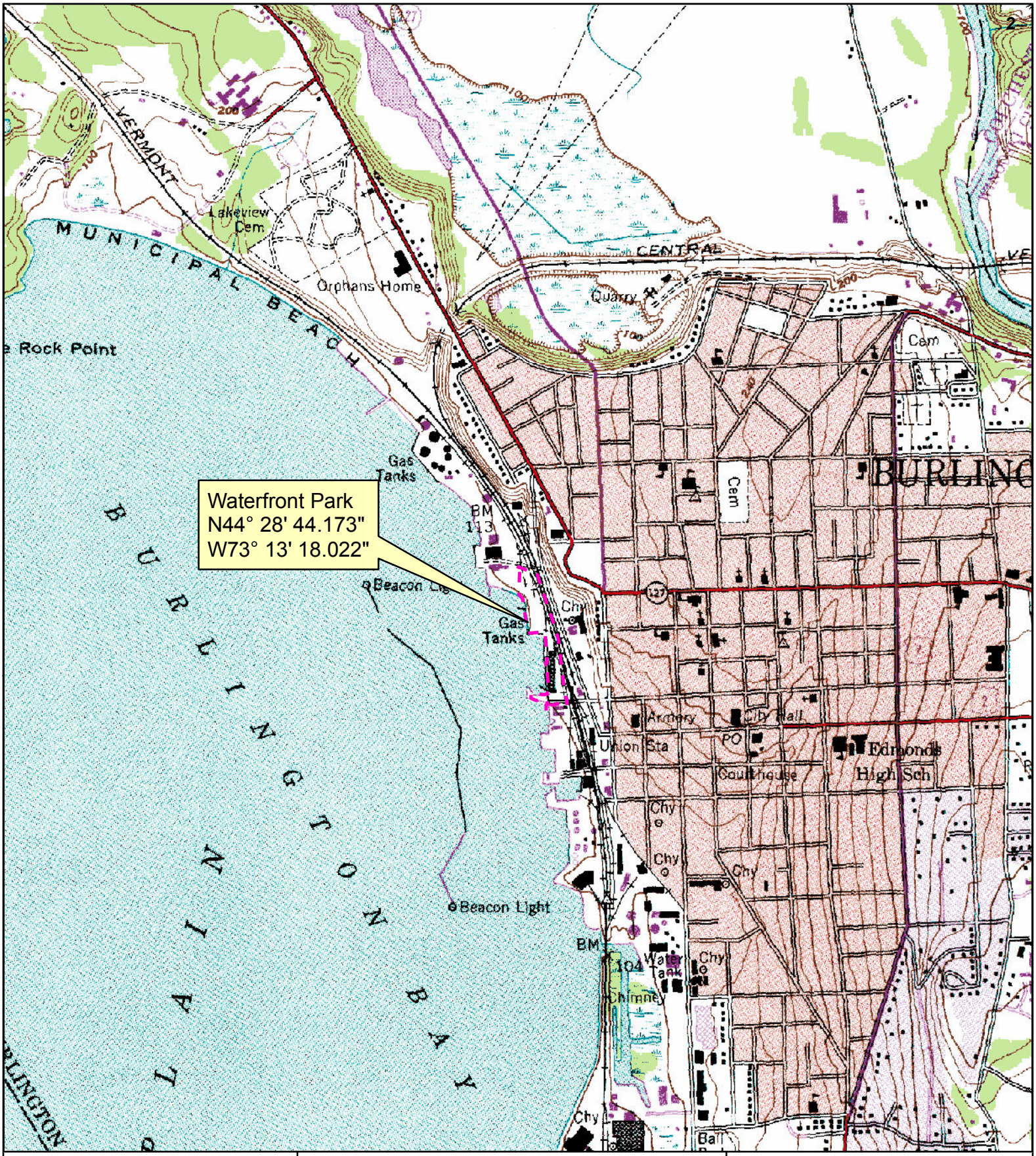
4,000 2,000 0 4,000 Feet

Sources: Background: USGS Topographic Quads (Burlington, Colchester, Colchester Point, Willsboro Bay - 1997); Bike Path centerline by VHB (2013)

VHB Vanasse Hangen Brustlin, Inc.

Prepared by: JAT

F:\57634.00\GIS\Project\USGS Site Location Map.mxd



Legend

Waterfront Park

City of Burlington
Waterfront Park
Burlington, Vermont
Site Location Map

December 12, 2013

1,000 500 0 1,000

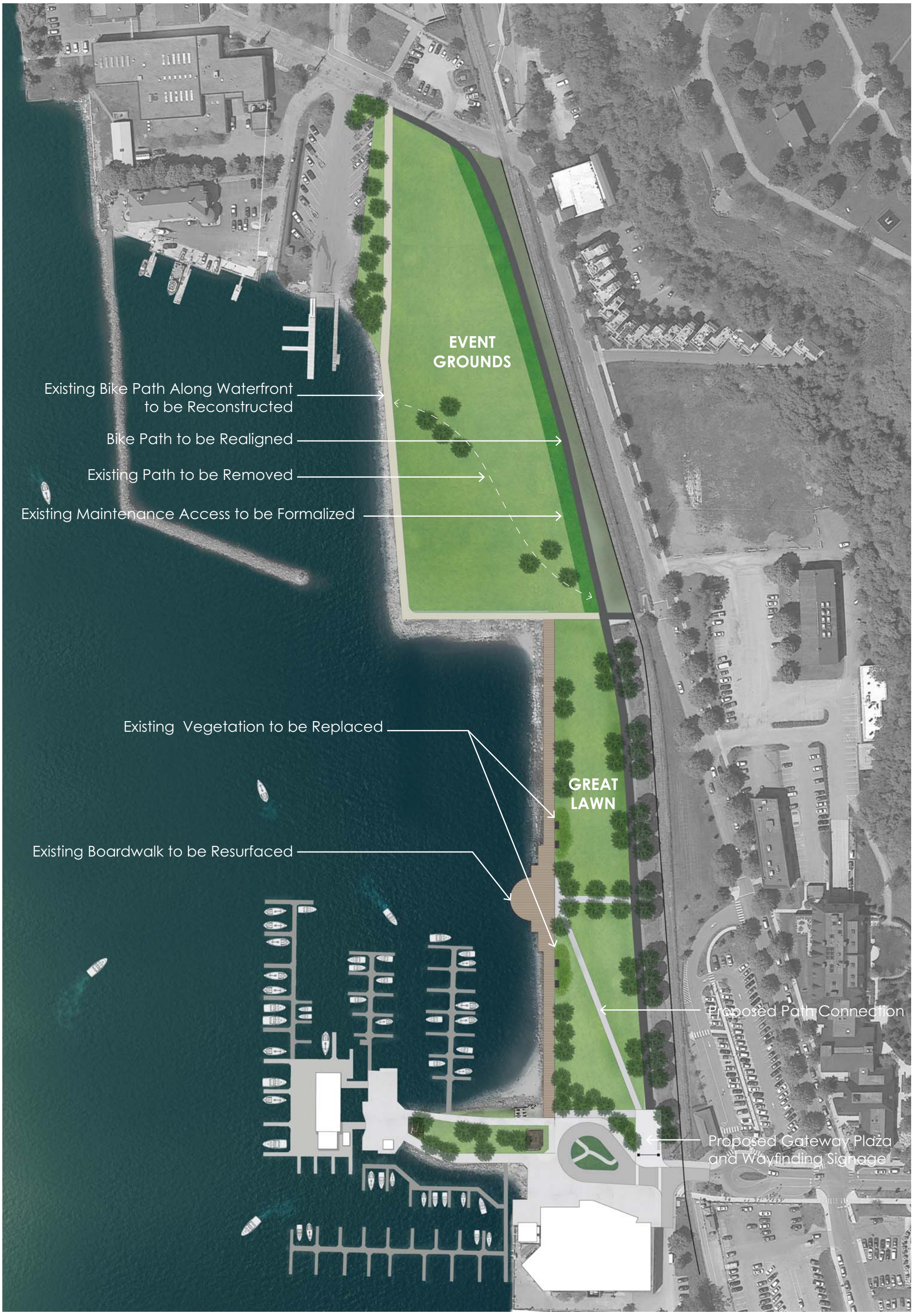
Feet

Sources: Background: USGS Topographic Quads (Burlington, Colchester, Colchester Point, Willsboro Bay - 1997); Bike Path centerline by VHB (2013)

VHB *Vanasse Hangen Brustlin, Inc.*

Prepared by: JWG

F:\57634.00\GIS\Project\USGS Site Location Map.mxd

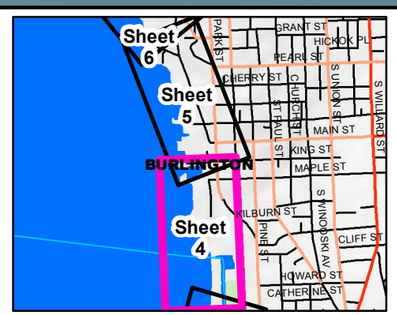


1:125

0 10 50 100 N

WATERFRONT PARK UPGRADES
Site Plan





Sources: Background by VMP (2012); Landfills, Brownfields, and Hazardous Waste Sites from VT DEC (2013); UST Site data provided by VT DEC (2010); Pollution Source Inventories (PSI) data provided by VT DEC (1980); Surface water data from VCGI (2014); Streams from VT Hydrography Dataset (2008) and VHB (2013); Roads by VTrans and from VCGI (2014); Contour layer from VCGI (2014). The EPA facilities from US EPA (2014). Contaminant Plumes from various sources (see labels), georeferenced by VHB (2013).

Source Consultant Acronyms:
H&N = Heindel & Noyes, Inc.
WEM = Waite Environmental Management
WHEM = Waite Heindel Environmental Management

Legend

Bike Path Sections
- Odd
- Even

Bike Path Proposed
- Odd - Dashed
- Even - Dashed
- Search Radius - 500 ft
- Strip Map Route 1
- Streams (VHB)
- Streams
- VSWI Wetland
- Waterbody (VHD)

- Town Boundary
- Parcel Boundary
- Railroad (VTrans)
- Road

Elevation Contour
- 10 ft

USTs
- Active
- Removed

Hazardous Waste Sites
- Active
- Closed
- VT Brownfield
- PSI (1980)
- Closed
- VT RCRA

EPA Facilities
- CERCLIS
- EPA Brownfield
- TSD Facility
- RCRAINFO
- TRIS
- Funcigide/Insecticide
- LUST-ARRA

Contaminant Plume
- Arsenic
- BTEX; Petroleum
- Chlorinated VOCs
- PAHs
- Petroleum, PCBs
- Barge Canal
- Urban North40
- Mobil Terminal
- Alden Waterfront

City of Burlington
Bike Path Rehabilitation
Burlington, Vermont
Oil and Hazardous Materials Series

Sheet Number 4

July 15, 2014

200 100 0 200 Feet

VHB Vanasse Hangen Brustlin, Inc.

\\VTNFDATA\projects\57634.00\GIS\Project\OHM\OHMAssessment_11x17_200scale_working2.mxd Prepared by: jgrossman on July 15, 2014

SMS# 20033098
Groundwater PCE, TCE, and off-site petroleum contamination
Vapor intrustion issues in nearby buildings (H&N, 2012)
Groundwater contamination may extend to Bike Path Project Area

20093899; low risk

941722; low risk

20012892; low risk
GW plume does not likley extend to bike path
TCE contaminated soil limited to on-site (WEM, 2012)

911003; low to medium risk
Freon detected in soil gas.
on-going investigation related to Moran Plant (DEC)

870005; medium risk
petroleum contaminated soils covered with fill

20012933; low risk

FRONT ST
NORTH AV
SHERMAN ST
BATTERY PARK RD
DEPOT ST
LAKE ST
CHERRY ST
MAIN ST
KING ST
S CHAMPLAIN ST
BATTERY ST
STEELE
NECR
VRR
PENNY LN
Chlorinated VOCs
TCE
PAHs
Arsenic
scrap yard
oil storage yard
rail yard
Moran Plant
Sheet 4
Sheet 5
Sheet 6
Sheet 7
BURLINGTON

962057
39542439
6883729
39542386
38781716
20053357
12144624
900540
921248
B9C26
B9C01
B9C31
39542395
131 Battery St
5260797
39542359
12144624
5296599
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39555576
39542377
20043199
41151785
972211
17613224
40477392
20104042; smac
41151776
11487701
20023000
992596

Sources: Background by VMP (2012); Landfills, Brownfields, and Hazardous Waste Sites from VT DEC (2013); UST Site data provided by VT DEC (2010); Pollution Source Inventories (PSI) data provided by VT DEC (1980); Surface water data from VCGI (2014); Streams from VT Hydrography Dataset (2008) and VHB (2013); Roads by VTrans and from VCGI (2014); Contour layer from VCGI (2014). The EPA facilities from US EPA (2014). Contaminant Plumes from various sources (see labels), georeferenced by VHB (2013).

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Bike Path Sections
- Odd
- Even

Bike Path Proposed
- Odd - Dashed
- Even - Dashed
- Search Radius - 500 ft
- Strip Map Route 1
- Streams (VHB)
- Streams
- VSWI Wetland
- Waterbody (VHD)

- Town Boundary
- Parcel Boundary
- Railroad (VTrans)
- Road

Elevation Contour
- 10 ft

USTs
- Active
- Removed

Hazardous Waste Sites
- Active
- Closed
- VT Brownfield
- PSI (1980)
- Closed
- VT RCRA

EPA Facilities
- CERCLIS
- EPA Brownfield
- TSD Facility
- RCRAINFO
- TRIS
- Funcigide/Insecticide
- LUST-ARRA

Contaminant Plume
- Arsenic
- BTEX; Petroleum
- Chlorinated VOCs
- PAHs
- Petroleum, PCBs
- Barge Canal
- Urban North40
- Mobil Terminal
- Alden Waterfront

City of Burlington
Bike Path Rehabilitation
Burlington, Vermont
Oil and Hazardous Materials Series

Sheet Number 5

July 15, 2014

200 100 0 200 Feet

VHB Vanasse Hangen Brustlin, Inc.

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APPENDIX 2

City of Burlington
Waterfront Park Upgrades Project and Burlington Bike Path Rehabilitation Project
Soil Management Matrix
Prepared by VHB on May 28, 2014

Primary DEC Contact: **Hugo Martinez-Cazon**
802-522-5564

Section(s)	Description	Secondary DEC Contact	EPA Contact	Hazardous Waste Sites or Historic Uses of Concern	Documented or Potential Contaminants of Concern	Laboratory Analyses for Excess Contaminated Soil*	Preferred Disposal Method
5	Perkins Pier to Maple Street	Michael Smith 802-249-5826	--	Historic Industrial Use (no documented releases)	Petroleum, PAHs, Metals	VOCs via EPA 8260B PAH via EPA 8270 RCRA metals via EPA 6010	1. Backfill 2. Stockpile 3. Off-site disposal
6 & 7	Maple Street to King Street & King Street to College Street	Matthew Becker 802-249-5770	--	151 South Champlain Street, SMS#20033098	Chlorinated Solvents (TCE, PCE)	VOCs via EPA 8260B	1. Backfill 2. Off-site disposal
8	Waterfront Park	Richard Spiese 802-249-5083	--	Alden Waterfront, SMS #870005	Petroleum, PAHs	VOCs via EPA 8260B PAH via EPA 8270 (SIM)	1. Backfill 2. Stockpile 3. Off-site disposal

* Does not include additiaonl laboratory analysis required for disposal of soil

VHB Vanasse Hangen Brustlin, Inc.

Table 1: Active Hazardous Waste Sites Within 0.5 mile Radius of Burlington Bike Path that Pose a Risk of Contamination to the Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB September 2013
Hazardous Waste Sites Data and Georeferencing from VT DEC (June 2013)

Site Number	Site Name	Address	Town	DEC Priority	DEC Staff	Discovery Date	Project Status	Associated Facility Type	Distance from Bike Path (ft)	Upgradient/ Downgradient	Bike Path Section(s)	Map Sheet	Opinion	Sources
770042	* Pine Street Barge Canal	King Street	Burlington	HIGH	Michael Smith	1/1/1981	ROD has been finalized. Consent Decree signed 9/30/99. Remedial design commences fall 99. Cleanup will commence in spring 2001.		188	upgradient	3 and 4	3 and 4	High Risk - Subsurface contamination likley to be encountered due to extent of contamination at Site	Arcadis and Hart Crowser (2008). Final NAPL Investigation Report Pine Street Canal Superfund Site. Burlington, Vermont. The Johnson Company, Inc. Compliance Monitoring Report Spring 2013. Pine Street Canal Superfund Site. Burlington, VT. Revision 0 July 2013.
20033098	151 South Champlain St. - Blinn House	151 South Champlain St.	Burlington	MED	Matthew Becker	<Null>	CAP: sub-salb depressurization systems installed 8/09 on three off site properties. Onsite sub-slab system is anticipated, prior to reoccupation of onsite building. Ongoing monitoring both on and offsite.	Brownfields	614	Upgradient	6 and 7	5	Low to Medium Risk- Chlorinated VOCs detected in groundwater in close proximity to bike path. Depth to water is approximately 5 feet below ground surface here. Building at 131 Main Street is affected by PCE Vapor Intrusion.	ATC Associates (2002). Phase I Environmental Site Assessment. August 12, 2002 Lincoln Applied Geology (2005). Phase II Suplimental Subsurface Investigation Report. September 22, 2005. Heindel & Noyes, Inc. (2011). Phase II Corrective Action Report. October 26, 2011. Heindel & Noyes, Inc. (2012). Phase IIB Corrective Action Report, September 5, 2012
911003	Coast Guard	Depot St	Burlington	MED	Richard Spiese	1/1/1991	New MWs installed as part of Penny Lane investigation. Some contamination discovered. Awaiting lab analysis and work plan.	UST (Facility ID 1123)	78	Downgradient	8	5	Low to Medium Risk - Contamination at Coast Guard is being investigated as part of the Moran Plan Investigations. UST at Coast Guard not likely to affect Bike Path	DEC Summary, Correspondence with Hugo Martinez Cazon
941585	North 40 Urban Reserve	C V R Northern Properties	Burlington	LOW	Matthew Becker	4/1/1994	Assessment of surface soils required.	VT Brownfield	0 to 302	Upgradient, Sidegradient, Downgradient	9	6	High Risk - Given the nature and location of contamination and the proximity to the Project Area, contamination is likely to impact the Project Area.	Heindel & Noyes, Inc. (1997). Phase I Environmental Site Assessment. November 12, 1997 Stone Environmental, Inc. (2012). Conceptual Site Model and Data Gap Analysis. November 5, 2012
20053357	Moran Plant	Lake St	Burlington	MED	Matthew Becker	6/10/2005	Interim CAP approved. Site Access Limitations are in place. Implementation ongoing in phases.	--	269	Within bike path, downgradient	9	6	High Risk - Given the proximity of this property to the Site, hydrologically cross gradient location and the TPH concentrations in shallow soils near the bike path, contamination is likely to impact the Project Area.	Waite Environmental Management (2005). Phase II Environmental Site Assessment. May 18, 2005. The Johnson Company. (2011). Remediation Report. January 10, 2011 Waite Environmental Management (2009). Subsurface Investigation Report. December 7, 2009 Heindel & Noyes, Inc (2011). Site Investigation Report. October 17, 2011 Waite Environmental Management. (2012). Groundwater Monitoring Report. February 21, 2012.

high risk
medium risk
low risk

Table 2: Low Risk Active Hazardous Waste Sites within 500 feet of Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB September 2013
Hazardous Waste Sites Data and Georeferencing from VT DEC (June 2013)

Site Number	Site Name	Address	Town	DEC Priority	DEC Staff	Discovery Date	DEC Project Status	Associated Facility Type	Distance from Bike Path (ft)	Upgradient/ Downgradient	Bike Path Section(s)	Map Sheet	Opinion	Sources
20012933	Lake Champlain Basin Science Center	College St	Burlington	MED	Sarah A. Bartlett	8/20/2001	Underground storage tank removed. Contamination found. Investigation needed.	UST (ID unknown)	87	Downgradient	8	5	Not likely to affect Project based on downgradient location and limited amount of contamination	DEC summary
20012892	131 Battery St	131 Battery St	Burlington	MED	Hugo Martínez Cazón	6/25/2001	Soil samples taken. MW's installed. cleanup needed. Notice to Land Record 3/13/08. Workplan received 3/14/10. Comments 4/16/10. Additional investigation effort in 2012. Workplan pending 2013.	UST (ID unknown)	294	Upgradient	7	5	Low Risk to Project; GW TCE plume does not likely extent to bike path, low concentrations at downgradient edge, TCE contaminated soils limited to on-site area.	Waite Environmental Management, LLC. (2012). Additional Groundwater Investigation Report. April Cornell Holdings Property. 131 Battery Street, Burlington, VT. VT DEC Site #2001-2892. September 24, 2012.
941722	Spillanes Texaco	125 Battery St	Burlington	LOW	Richard Spiese	11/1/1994	GWES exceeded in one monitor well, continued semiannual groundwater monitoring warranted. Further investigation showed VGWESs exceeded around property. Site in MNA.	UST Facility ID: 233	320	Upgradient	7	5	Likely low risk to Project based on distance and Low priority status. DEC also indicates that site is in Monitored Natutal Attenuation.	DEC summary
20104041	30 Main ROW	30 Main	Burlington	MED	Hugo Martínez Cazón	3/1/2010	Workplan approved 4/16/10 Note: Adjoining property at 30 Main had an UST removal 7/16/1996, see "former J&B International" VTP000007121.	UST	471	Upgradient	7	5	Low Risk to Project based on distance and limited amount of contamination identified	Stone Environmental, Inc. (2011). 30 Main Street Site Investigation SMS#20120-4041. Draft Report.

high risk
medium risk
low risk

Table 3: Low Risk HWS greater than 500 feet but less than 0.5 miles of Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB September 2013
Hazardous Waste Sites Data and Georeferencing from VT DEC (June 2013)

Site Number	Site Name	Address	Town	DEC Priority	DEC Staff	Discovery Date	DEC Project Status	Associated Facility Type	Distance from Bike Path (ft)	Upgradient/ Downgradient	Bike Path Section(s)	Map Sheet	Opinion	Sources
20043192	453 Pine Street	453 Pine Street	Burlington	LOW	Michael Smith	<Null>	Brownfields Project, initial assessment March 2004 Site is likely no longer a brownfields site. SMS received work plan for SI from a different party. ECS is now the consultant.	--	798	Upgradient	3 and 4	Overview Map Sheet 1	Low Risk because Site is affected by contamination from Barge Canal Site	No available information; Site part of Barge Canal Site
900594	Leo Duncan Auto Service	291 St. Paul Street	Burlington	LOW	Gerold Noyes	7/21/2005	Site reopened due to off-site migration, see also #2003-3138, occasional FP. former gas station. 1/2010 6 of 9, 11/2010 4 of 8 MWs 11/2012 3 of 7 MWs above VGES. annual sample	UST Facility ID: 8649477	1800	up	4	Overview Map Sheet 1	Low Risk to Project based on distance	Report not available online; did not review due to distance
20002827	266 Champlain St	266 Champlain St	Burlington	LOW	Gerold Noyes	10/4/2000	Contam found from former UST. Site invest complete, biennial monitor	UST Facility ID: 5551723	753	Upgradient	4	4	Low Risk to Project based on distance	H&N (2011). 2011 Biennial Groundwater Monitroing Report. 266 South Champlain Street, Burlington, VT (VTDEC Site #2000-2827)
20033161	Westwind Condominiums	308 S Winooski Ave	Burlington	LOW	Tim Cropley	9/30/2003	Underground storage tank removed. Contamination found. Groundwater investigation performed and three rounds of MW samples collected in 2004. Final 2 rounds had no detectable VOCs. Mws properly abandonned. Site to be SMACed.	UST (ID unknown)	5300	Upgradient	4	Overview Map Sheet 2	Low risk to Project based on distance and SMAC eligibility	did not review reports due to distance from project
20134377	Bobbin Mill Apartments	235 Pine Street	Burlington	MED	Hugo Martínez Cazón	5/3/2013	Phase II focused on surface soil characterization	--	800	Upgradient	5	Overview Map Sheet 3	Low Risk to Project based on distance	did not review reports due to distance from project
941676	Handy's Texaco	South Winooski Ave	Burlington	MED	Matt Moran	9/1/1994	UST gasoline and diesel contamination. Initial site investigation completed. Ongoing monthly FP recovery, and annual site monitoring. Overall product recovery trends heading downwards. Next GW sampling event scheduled August 2012. In September 2010, 3 MWs were repaired.	UST Facility ID: 8620284	2640	Upgradient	5 and 6	Overview Map Sheet 2	Low Risk to Project based on distance	did not review reports due to distance from project
951877	Simon's Downtown Quick Stop	93 South Winooski Ave	Burlington	HIGH	Matt Moran	9/1/1995	Release from gasoline USTs. Third party impacts still being investigated - FP offsite and weekly recovery ongoing through 2012. 624 gallons of gasoline recovered 2004-2012; 499 gallons hand bailing and 125 gallons from short MPE events. July 2011 vapor intrusion investigation and targeted MPE. VI results reflect possible chlorinated solvent plume. GPR in October 2009 found no evidence of abandoned USTs. Approved PCS thinspreading 3/00.	UST Facility 6582259	2560	Upgradient	5 and 6	Overview Map Sheet 2	Low Risk to Project based on distance; DEC summary	did not review reports due to distance from project
20073738	Mansfield Professional Building	183 St Paul St	Burlington	HIGH	Ashley Desmond	10/25/2007	Installed 5 MW's during initial site investigation. Dissolved and free phase contamination identified in parking lot. No significant migration to offsite properties. Two abandoned USTs were removed from the front of the building under the green belt/roadway after investigation had begun. Approximately 4,000 tons of petroleum impacted soil was removed from the property during installation of a new residential building during Winter 2012-13. Ongoing monitoring will be conducted to assess ongoing impacts from residual soil and groundwater contamination.	UST (ID unknown)	1380	Upgradient	6	Overview Map Sheet 3	Low Risk to Project; contamination appears to be localized to site vicinity	did not review reports due to distance from project
20083882	14 Browns Court	14 Browns Court	Burlington	LOW	Hugo Martínez Cazón	7/30/2008	Section 1926 UST closure in place and investigation.	UST (ID unknown)	1490	Upgradient	6	Overview Map Sheet 3	Low Risk to Project based on distanced and limited amount of contination identified.	did not review reports due to distance from project
20093899	157 South Champlain Street	157 South Champlain Street	Burlington	LOW	Matthew Becker	1/21/2009	See SMS 972211 for previous work on this parcel. CAP required for disturbance of impacted soils left in place at depth and vapor mitigation system. Petroleum and PCB groundwater contamination	--	578	Upgradient	6 and 7	5	Low Risk to Project; contamination appears to be localized to site vicinity	Stone Environmental, Inc. (2009). Draft Phase II Environmental Site Assessment and Remedial Cost Estimation. 157 South Champlain Street, Burlington, VT.
992711	Salvation Army	64 Main St	Burlington	MED	Matt Moran	10/15/1999	Underground storage tank removed. Contamination found. Investigation completed. Evaluating for SMAC designation.	UST Facility ID: 552520	720	Upgradiemt	7	Overview Map Sheet 2	Low risk to Project based on distance and SMAC eligibility	did not review reports due to distance from project
20012849	Howard Opera House	159 Bank Street	Burlington	LOW	Lynda Provencher	12/1/2000	Petroleum contamination found in soils adjacent to relic UST at depths of approx. 10-14 feet. Free product is present in one monitoring well. Annual groundwater monitoring ongoing.	UST (ID unknown)	2190	Upgradient	7	Overview Map Sheet 2	Low Risk to Project based on distance	did not review reports due to distance from project
20104044	127 S Winooski ROW	127 S Winooski Street	Burlington	MED	Hugo Martínez Cazón	3/1/2010	March 2011 report is online Groundwater is below VGES some soil vapors in the ROW	Floor Drain/Dry Well	2400	Upgradient	7	Overview Map Sheet 3	Low Risk to Project based on distance	did not review reports due to distance from project
951940	Former Griffin Residence	39 Allen St	Burlington	MED	Linda Elliott	9/1/1995	1995 AST fuel oil release in basement. Fuel oil contamination discovered beneath basement slab with elevated PID readings upto 200PPM. New owners to hire consulting firm to investigate further Spring 2011. Based on results determine is eligible for site closure.	AST	2500	Upgradient	9	Overview Map Sheet 2	Low Risk to Project based on distance; DEC summary	did not review reports due to distance from project

high risk
medium risk
low risk

Table 5: Closed Hazardous Waste Sites Within 0.5 mile Radius of Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB September 2013
Hazardous Waste Sites Data and Georeferencing from VT DEC (June 2013)

Site Number	Site Name	Address	Town	DEC Priority	DEC Staff	Discovery Date	Closure Date	DEC Project Status	Associated Facilities	Distance from Bike Path (ft)	Upgradient/ Downgradient	Bike Path Section(s)	Map Sheet	Opinion
770179	Vermont Railway	1 Railway Lane	Burlington	SMAC	Richard Spiese	1/1/1991	8/29/2008	Epa Removal Pa Completed 7/89. Fuel oil UST removal and GW investigation showed limited soils and GW contamination. GW monitoring GW met GWESs.	UST Facility 6582550; RCRA gernator, NPL NFAP	306	Upgradient	4	4	Low Risk
870035	Maltex Pond	n/a	Burlington	NFAP	Unassigned	<Null>		Site Closed	--	293	Upgradient	4	4	Combined with Barge Canal File
870097	Ultramar	n/a	Burlington	NFAP	Unassigned	<Null>	--	Site Closed	UST (facility ID unknown)	925	Upgradient	4	4	Low Risk
890455	Independent Foods	S. Champlain St.	Burlington	SMAC	Richard Spiese	1/1/1989	5/24/2010	Notice to land record put on deed. Site SMACed.	UST (facility ID unknown)	579	Upgradient	4	4	Low Risk
992592	Burlington Public Works Garage	Pine St.	Burlington	SMAC	Michael Smith	8/18/1998	2/2/2011	site SMAC 2 Feb 2011	UST (ID unknown)	902	Upgradient	4	4	Low Risk
20023000	Hershberg Property (Good News Garage)	23 King St	Burlington	SMAC	Lynda Provencher	5/27/2002	10/15/2002	Underground storage tanks removed; no groundwater encountered; soil samples indicated no contaminants above detection limits; no drinking water wells in the area.	UST ID: 6552226	237	Upgradient	6	5	Low Risk
972211	157 South Champlain Street	157 South Champlain St	Burlington	SMAC	Hugo Martínez Cazón	2/1/1997	2/2/2000	Initial investigation completed. Removal of part of building and excavation completed. Site SMCed February 2000. Property also listed as SMS 20093899	--	597	Upgradient	6 and 7	5	Low Risk
992596	Lake Champlain Transportation Co	King Street Dock	Burlington	SMAC	Gerold Noyes	3/29/1999	7/10/2000	UST removed. Contamination found. Investigation completed. Soil stockpile treated on site. SMAC	UST 8349804	216	Downgradient	6 and 7	5	Low Risk
20043199	Ackerman Property	53 Main Street	Burlington	SMAC	Hugo Martínez Cazón	3/8/2004	3/26/2004	SMAC designation is pending verification of Notice to Land Record and Well closures. Site opened closed. SMAC	--	646	Upgradient	7	Overview Map Sheet 2	Low Risk
870005	Central Vt R.r./ Alden Waterfront	Waterfront	Burlington	NFAP	Richard Spiese	<Null>	11/3/1992	Closed	AST	114	Surrounding	8	5	Medium Risk - Contaminated soils covered by fill
921248	Old Pease Grain Property	43 Lake Street	Burlington	NFAP	Lynda Provencher	<Null>	10/1/1993	Gasoline UST. Site Assess Complete, No Impact To Sensitive Receptors	UST (ID unknown)	270	Upgradient	8	Overview Map 2	Low Risk
962057	Radisson Hotel - Burlington	60 Battery St	Burlington	SMAC	Unassigned	9/1/1996	11/1/1996	Invest Complete Following Ust Removal. Site Closed.	UST (ID unknown)	616	Upgradient	8	Overview Map 2	Low Risk
911022	McCauliffe's Office Products	Cherry St	Burlington	NFAP	Unassigned	<Null>	6/14/1991	Site Assessment Showed Limited Contamination	UST (ID unknown)	1000	Upgradient	8 and 9	Overview Map 3	Low Risk
900540	Burlington Electric	n/a	Burlington	NFAP	Unassigned	<Null>	9/10/1993	Site Closed	UST (ID unknown)	310	Downgradient	9	5	Low Risk
941698	Mcgaffreys Sunoco	98 North Ave	Burlington	SMAC	Unassigned/jf	10/1/1994	12/1/1998	Soils treated and thinspread off-site.	UST ID: 1797	637	Upgradient	9	6	Low Risk due to distance and removal of source
962048	Burlington College	95 North Ave	Burlington	SMAC	Unassigned	8/1/1996	3/24/1998	UST removed. Investigation completed. No additional work required by SMS. Site SMACed on 3/24/98.	--	500	Upgradient	9	6	Low Risk
20104042	23 King ROW	33 King Street	Burlington	MED	Hugo Martínez Cazón	3/1/2010		Vapor Intrustion workplan due 12/10 (Initial Site investigation due to relic filled-in place UST in Burlington ROW.)	UST; EPA LUST ARRA ID 41151776	415	Upgradient	6	5	Low Risk

high risk
medium risk
low risk

Vanasse Hangen Brustlin, Inc.

Table 6: Underground Storage Tanks Within 0.5 Miles of the Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB October 2013

Facility ID	Facility Name	Address	HWS SMS#	Status	Distance from Bike Path (ft)
Active UST Facilities					
567	Champlain Farms Shell 40-B4	219 Main Street		ACTIVE	718
624	Burlington Fire Department	136 South Winooski Aven		ACTIVE	724
2620	Burlington North WWTP	3000 North Avenue Extension		ACTIVE	385
6582259	Downtown Quick Stop	93 South Winooski Avenue	951877	ACTIVE	756
8620284	Handy's Shell	75 South Winooski Avenue	941676	ACTIVE	739
Pulled UST Facilities					
None Listed					

Table 7: EPA Facilities within 0.5 mile Radius of Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB October 2013
Data and Georeferencing from EPA (September 2013)

Vanasse Hangen Brustlin, Inc.

Registry ID	Program Acronym	Program ID	Interest Type	Source Database	Name	Address	Town
Acres/Brownfields Program							
38722674	ACRES	53761	BROWNFIELDS PROPERTY	ACRES	BROWN'S COURT	0 BROWNS COURT	BURLINGTON
38749398	ACRES	34021	BROWNFIELDS PROPERTY	ACRES	151 SOUTH CHAMPLAIN STREET	151 SOUTH CHAMPLAIN STREET	BURLINGTON
38781716	ACRES	12972	BROWNFIELDS PROPERTY	ACRES	FORMER MORAN GENERATING STATION	475 LAKE ST	BURLINGTON
39542359	ACRES	12963	BROWNFIELDS PROPERTY	ACRES	URBAN RESERVE	2 LAKE STREET	BURLINGTON
39542377	ACRES	12965	BROWNFIELDS PROPERTY	ACRES	ARCHITECTURAL SALVAGE	53 MAIN STREET	BURLINGTON
39542386	ACRES	12966	BROWNFIELDS PROPERTY	ACRES	LAKE CHAMPLAIN HOUSING	300 LAKE STREET	BURLINGTON
39542395	ACRES	12967	BROWNFIELDS PROPERTY	ACRES	MULTIMODAL TRANSPORTATION CENTER	131 BATTERY STREET	BURLINGTON
39542411	ACRES	12970	BROWNFIELDS PROPERTY	ACRES	VERMONT TRANSIT PASSENGER TERMINAL	345 PINE STREET	BURLINGTON
39542439	ACRES	12971	BROWNFIELDS PROPERTY	ACRES	INTERIM DEVELOPMENT AREA	DEPOT STREET	BURLINGTON
39542965	ACRES	12981	BROWNFIELDS PROPERTY	ACRES	SUPERBLOCK PROPERTY	250 MAIN STREET	BURLINGTON
39552695	ACRES	12976	BROWNFIELDS PROPERTY	ACRES	CENTRAL MARKET	82 SOUTH WINOOSKI STREET	BURLINGTON
39555576	ACRES	12982	BROWNFIELDS PROPERTY	ACRES	55 MAIN STREET	55 MAIN STREET	BURLINGTON
40477392	ACRES	93521	BROWNFIELDS PROPERTY	ACRES	157 SOUTH CHAMPLAIN STREET	157 SOUTH CHAMPLAIN STREET	BURLINGTON
40822081	ACRES	111504	BROWNFIELDS PROPERTY	ACRES	22-26 JOHNSON STREET	22-26 JOHNSON STREET	BURLINGTON
40822090	ACRES	111505	BROWNFIELDS PROPERTY	ACRES	27-31 PERU STREET	27-31 PERU STREET	BURLINGTON
40822107	ACRES	111506	BROWNFIELDS PROPERTY	ACRES	52 NORTH CHAMPLAIN STREET	52 NORTH CHAMPLAIN STREET	BURLINGTON
40822116	ACRES	111507	BROWNFIELDS PROPERTY	ACRES	56 NORTH CHAMPLAIN STREET	56 NORTH CHAMPLAIN STREET	BURLINGTON
40822125	ACRES	111508	BROWNFIELDS PROPERTY	ACRES	57-63 NORTH CHAMPLAIN STREET	57-63 NORTH CHAMPLAIN STREET	BURLINGTON
40822134	ACRES	111509	BROWNFIELDS PROPERTY	ACRES	88 SHERMAN STREET	88 SHERMAN STREET	BURLINGTON
40822143	ACRES	111510	BROWNFIELDS PROPERTY	ACRES	73-75 SHERMAN STREET	73-75 SHERMAN STREET	BURLINGTON
40822170	ACRES	111513	BROWNFIELDS PROPERTY	ACRES	221 PINE STREET	221 PINE STREET	BURLINGTON
40822198	ACRES	111515	BROWNFIELDS PROPERTY	ACRES	322 ST. PAUL STREET	322 ST. PAUL STREET	BURLINGTON
45009682	ACRES	133141	BROWNFIELDS PROPERTY	ACRES	WHARF LANE APARTMENTS	57 MAPLE STREET	BURLINGTON
46370128	ACRES	133142	BROWNFIELDS PROPERTY	ACRES	BOBBIN APARTMENTS	234 SOUTH CHAMPLAIN STREET	BURLINGTON
Treatment, Storage and Disposal (TSD) Facilities							
5261448	BR	VTD043783992	HAZARDOUS WASTE BIENNIAL REPORTER	RCRAINFO	VERMONT RAILWAY INC	1 RAILWAY LN	BURLINGTON
5262189	BR	VTD988375408	HAZARDOUS WASTE BIENNIAL REPORTER	RCRAINFO	CHITTENDEN SOLID WASTE DISTRICT	339A PINE ST	BURLINGTON
CERCLIS/Superfund Sites							
9259809	CERCLIS	VTD980523062	SUPERFUND NPL	CERCLIS	PINE STREET CANAL	PINE ST	BURLINGTON
Leaking Underground Storage Tank Facilities (American Reinvestment and Recovery Act)							
41151758	LUST-ARRA	1390	LEAKING UNDERGROUND STORAGE TANK - ARRA	LUST-ARRA	11 SOUTH WINOOSKI STREET	11 SOUTH WINOOSKI STREET	BURLINGTON
41151767	LUST-ARRA	1391	LEAKING UNDERGROUND STORAGE TANK - ARRA	LUST-ARRA	127 SOUTH WINOOSKI STREET	127 SOUTH WINOOSKI STREET	BURLINGTON
41151776	LUST-ARRA	1392	LEAKING UNDERGROUND STORAGE TANK - ARRA	LUST-ARRA	33 KING STREET	23 KING STREET	BURLINGTON
41151785	LUST-ARRA	1393	LEAKING UNDERGROUND STORAGE TANK - ARRA	LUST-ARRA	30 MAIN STREET	30 MAIN STREET	BURLINGTON
41151794	LUST-ARRA	1394	LEAKING UNDERGROUND STORAGE TANK - ARRA	LUST-ARRA	RASPUTIN'S BAR & NIGHTCLUB	163 CHURCH STREET	BURLINGTON
RCRA Harzardous Waste Generators							
1915713	RCRAINFO	VTD002068500	CESQG	RCRAINFO	SPECIALTY FILAMENTS INC	1 HOWARD STREET	BURLINGTON
2088516	RCRAINFO	VTD042466037	UNSPECIFIED UNIVERSE	RCRAINFO	HP HOOD INC	187 SOUTH WINOOSKI AVENUE	BURLINGTON
5260680	RCRAINFO	VT5000002337	CESQG	RCRAINFO	MCCAFFREYS SUNOCO	98 NORTH AVE	BURLINGTON
5260797	RCRAINFO	VTD000652123	UNSPECIFIED UNIVERSE	RCRAINFO	C & O OIL CO	11 LAKE ST	BURLINGTON
5261028	RCRAINFO	VTD002070811	UNSPECIFIED UNIVERSE	RCRAINFO	LANE PRESS INC	305 ST PAUL ST	N BURLINGTON
5261215	RCRAINFO	VTD019101591	UNSPECIFIED UNIVERSE	RCRAINFO	MCAULIFFE INC	50 CHERRY ST BURLINGTON SQ NO	BURLINGTON
5261448	RCRAINFO	VTD043783992	LQG	RCRAINFO	VERMONT RAILWAY INC	1 RAILWAY LN	BURLINGTON

Table 7: EPA Facilities within 0.5 mile Radius of Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB October 2013
Data and Georeferencing from EPA (September 2013)

Vanasse Hangen Brustlin, Inc.

Registry ID	Program Acronym	Program ID	Interest Type	Source Database	Name	Address	Town
RCRA Harzardous Waste Generators							
5261448	RCRAINFO	VTD004859088	UNSPECIFIED UNIVERSE	RCRAINFO	VERMONT RAILWAY INC	1 RAILWAY LN	BURLINGTON
5261536	RCRAINFO	VTD052502929	UNSPECIFIED UNIVERSE	RCRAINFO	LAKESIDE DIV OF VERMONT	431 PINE ST	BURLINGTON
5262189	RCRAINFO	VTD988375408	TRANSPORTER	RCRAINFO	CHITTENDEN SOLID WASTE DISTRICT	339A PINE ST	BURLINGTON
5262189	RCRAINFO	VTD988375408	CESQG	RCRAINFO	CHITTENDEN SOLID WASTE DISTRICT	339A PINE ST	BURLINGTON
5262535	RCRAINFO	VTR000002972	CESQG	RCRAINFO	VT DEPT OF BGS OFFICE MAINT SHOP	108 CHERRY ST	BURLINGTON
5262544	RCRAINFO	VTR000002980	CESQG	RCRAINFO	VT DEPT OF BGS COSTELLO COURT MAINT SHOP	32 CHERRY ST	BURLINGTON
5293235	RCRAINFO	VT5000000190	CESQG	RCRAINFO	CITIZENS OIL CO INC	377 PINE ST	BURLINGTON
5293379	RCRAINFO	VT5000000521	CESQG	RCRAINFO	RESOURCE - A NON-PROFIT COMMUNITY ENTERPRISE	266 PINE ST	BURLINGTON
5293814	RCRAINFO	VT5000001867	UNSPECIFIED UNIVERSE	RCRAINFO	LIGHT WORKS INC	120 PINE ST	BURLINGTON
5293887	RCRAINFO	VTD054015607	CESQG	RCRAINFO	BURLINGTON FREE PRESS	191 COLLEGE ST	BURLINGTON
5293896	RCRAINFO	VTD054675459	UNSPECIFIED UNIVERSE	RCRAINFO	GOODYEAR AUTO SERVICE CTR	26 PEARL ST	BURLINGTON
5295965	RCRAINFO	VTR000004572	UNSPECIFIED UNIVERSE	RCRAINFO	FLETCHER ALLEN HEALTH CARE	199 MAIN ST STE 9	BURLINGTON
5296045	RCRAINFO	VTR000004663	UNSPECIFIED UNIVERSE	RCRAINFO	FLETCHER ALLEN HEALTH CARE	1 BURLINGTON SQ	BURLINGTON
5296054	RCRAINFO	VTR000004671	UNSPECIFIED UNIVERSE	RCRAINFO	FLETCHER ALLEN HEALTH CARE-GIVEN HEALTH CARE	310 PINE ST	BURLINGTON
5296456	RCRAINFO	VTR000005512	CESQG	RCRAINFO	LIGHT WORKS INC	19 MARBLE AVE	BURLINGTON
5296599	RCRAINFO	VTR000005850	SQG	RCRAINFO	UNIV OF VERMONT RUBENSTEIN ECOSYS SCI LAB	1 COLLEGE ST	BURLINGTON
5296731	RCRAINFO	VTR000006338	CESQG	RCRAINFO	SKIRACK	85 MAIN ST	BURLINGTON
5297446	RCRAINFO	VTR000008615	CESQG	RCRAINFO	WESCO BURLINGTON SHELL	219 MAIN ST	BURLINGTON
5297936	RCRAINFO	VTR000010322	CESQG	RCRAINFO	ABRAHAM CAMERA	111 CHURCH ST	BURLINGTON
5298187	RCRAINFO	VTR000011783	UNSPECIFIED UNIVERSE	RCRAINFO	MATTE PROPERTY	128 NORTH ST	BURLINGTON
5299541	RCRAINFO	VTR000014589	CESQG	RCRAINFO	RITE AID # 10317	158 CHERRY ST	BURLINGTON
6536971	RCRAINFO	VTR000501411	SQG	RCRAINFO	HANDYS DOWNTOWN QUICK STOP & DELI	93 S WINOOSKI AVE	BURLINGTON
6536999	RCRAINFO	VTR000501437	CESQG	RCRAINFO	SIMONS PARK STREET STORE & DELI	42 PARK ST	BURLINGTON
6883729	RCRAINFO	VT5000001420	CESQG	RCRAINFO	US COAST GUARD STA BURLINGTON	DEPOT ST	BURLINGTON
8206379	RCRAINFO	VTD099683484	UNSPECIFIED UNIVERSE	RCRAINFO	CARONS AUTO BODY INC	162-1/2 MAPLE ST	BURLINGTON
8208929	RCRAINFO	VTD988367553	UNSPECIFIED UNIVERSE	RCRAINFO	ENVIRONMENTAL DEPOT	339 PINE STREET	BURLINGTON
8211130	RCRAINFO	VTR000006320	CESQG	RCRAINFO	HANDYS SHELL	75 SOUTH WINOOSKI AVE	BURLINGTON
8211684	RCRAINFO	VTR000008664	SQG	RCRAINFO	LAKE CHAMPLAIN TRANSPORTATION COMPANY	KING ST DOCK	BURLINGTON
9509273	RCRAINFO	VT5000000497	CESQG	RCRAINFO	HORSMAN H	431 PINE ST	BURLINGTON
12144624	RCRAINFO	VTR000013839	CESQG	RCRAINFO	BURLINGTON ELECTRIC GENERATING PLANT	1 LAKE STREET	BURLINGTON
12192849	RCRAINFO	VTR000502815	CESQG	RCRAINFO	CONANT METAL & LIGHT	270 PINE ST	BURLINGTON
14436823	RCRAINFO	VTR000506014	CESQG	RCRAINFO	TRACKSIDE TERMINAL OIL CO LLC	267 BATTERY ST	BURLINGTON
16710068	RCRAINFO	VTR000509497	CESQG	RCRAINFO	FOX PRINTING	39 KILBURN ST	BURLINGTON
17613224	RCRAINFO	VTR000510248	CESQG	RCRAINFO	BETTER BUS & BUG	151 S CHAMPLAIN ST	BURLINGTON
20119977	RCRAINFO	VTR000511774	CESQG	RCRAINFO	DUNCANS AUTO	291 ST PAUL ST	BURLINGTON
22310097	RCRAINFO	VTR000512772	CESQG	RCRAINFO	COMMUNITY COLLEGE OF VERMONT	119 PEARL ST	BURLINGTON
31403611	RCRAINFO	VTR000514547	CESQG	RCRAINFO	US POST OFFICE & COURT HOUSE	11 ELMWOOD AVE	BURLINGTON
31412987	RCRAINFO	VTR000515874	CESQG	RCRAINFO	MACYS EAST VERMONT #204	67 CHERRY ST	BURLINGTON
33160692	RCRAINFO	VTR000517631	CESQG	RCRAINFO	VANTAGE PRESS INC	115 NORTH ST	BURLINGTON
37447652	RCRAINFO	VTR000518050	CESQG	RCRAINFO	ABERCROMBIE & FITCH	5 BURLINGTON SQUARE SPACE 2048	BURLINGTON
37447661	RCRAINFO	VTR000518068	CESQG	RCRAINFO	HOLLISTER CO	49 CHURCH ST	BURLINGTON
43231151	RCRAINFO	VTR000520445	CESQG	RCRAINFO	BURLINGTON LABORATORIES INC	2 CHURCH ST	BURLINGTON
Toxic Release Inventory							
2088516	TRIS	05401HPHDN187SO	TRI REPORTER	TRI REPORTING FORM	HP HOOD INC	187 SOUTH WINOOSKI AVENUE	BURLINGTON

Table 8: RCRA Facilities within 0.5 mile Radius of Project Area
Burlington Bike Path, Burlington, VT
Prepared by VHB October 2013
Data and Georeferencing from VT DEC

Facility ID	File Number	EPA ID	Facility Name	Mailing Address	Town
10142	04-03-002	VT5000000190	CITIZENS OIL COMPANY INC	377 PINE STREET	BURLINGTON
10144	04-03-004		H. HORSEMAN & CO	431 PINE STREET	BURLINGTON
10146	04-03-006	VT5000000521	STEREOTYPE & DESIGN	266 PINE STREET	BURLINGTON
10149	04-03-011	VTD042466037	H.P. HOOD INC	187 SOUTH WINOOSKI AVENUE	BURLINGTON
10153	04-03-015	VTR000002980	VERMONT STATE BUILDINGS	32 CHERRY STREET	BURLINGTON
10154	04-03-016	VTR000002972	VERMONT STATE BUILDINGS	108 CHERRY STREET	BURLINGTON
10158	04-03-020		FLETCHER ALLEN HEALTH CARE	310 PINE STREET, LANE PRESS BUILDING	BURLINGTON
10855	04-03-052	VTD054015607	BURLINGTON FREE PRESS	191 COLLEGE STREET	BURLINGTON
10867	04-03-104	VTD002068500	SPECIALTY FILAMENTS (WAS WHITING COMPANY A.C.)	1 HOWARD STREET	BURLINGTON
10872	04-03-114	VTD988375408	CHITTENDEN SOLID WASTE	339 PINE STREET	BURLINGTON

APPENDIX 3

Photoionization Detector Field Screening Procedure

PID Calibration and Calibration Log

All PID assays will be completed on-site using a minimum 10.2 electron volt (eV) unit. Prior to the collection and screening of samples, complete the following:

- Calibrate the PID unit to a benzene equivalent (e.g. 100 ppm isobutylene) in accordance with the manufacturer's instructions
- Perform calibrations each day the instrument is in use. Calibrate the instrument on-site and whenever significant climatic changes occur during screening activities
- Maintain an instrument log book, which may be reviewed by the DEC SMS upon request. Record the following:
  - PID make and model
  - The date and time of the calibration
  - Type of calibration gas used
  - Weather conditions including: relative humidity, wind, temperature, sample locations, background air and empty container values, and any other relevant information

Swipe-Screening: Soil Borings or Excavations

Prior to collecting samples for bag or jar headspace readings, an ambient (background) concentration reading should be completed. The background sample should be taken away from any overt sources of VOCs.

Prior to sampling procedures, an overview screen of the soil core or excavation bucket should be completed by creating a narrow linear depression in the soil with a clean implement and slowly sweeping the PID through the depression approximately one-inch from the soil. Cup one hand over the depression and inlet of the PID and note areas of maximum readings. Collect composite samples from the entire core or bucket, in addition to discrete samples where elevated PID measurements are observed, for bag or jar headspace readings.

Bag or Jar Headspace Technique

Soil samples collected during soil excavation or soil boring activities will be field screened in accordance with the headspace technique outlined below:

- **Jar**: Half fill one clean glass jar with the sample to be analyzed. Quickly cover the open top with two sheets of clean aluminum foil and subsequently apply screw cap to tightly seal the jars. Wide-mouth or mason-type jars are preferred. Jars ranging in size from 8 ounces (approximately 250 ml) to 16 ounces (approximately 500 ml) total capacity may be used. Vigorously shake jar for 15 seconds prior to development period.

- **Bag**: Half fill one clean plastic bag with the sample to be analyzed. Quickly seal the bag. Mix soil while bag is closed to homogenize, then vigorously shake bag for 15 seconds prior to development period.

- Allow headspace development for at least 10 minutes. Where ambient temperatures are below 32°F (0°C), headspace development should be within a heated vehicle or building. The screening will be conducted utilizing a portable photoionization detector (PID).

- Subsequent to headspace development, vigorously shake jar or bag for 15 seconds. For the jar technique, remove screw lid and expose foil seal. Quickly puncture foil seal with instrument sampling probe, to a point about one-half of the headspace depth. For the bag technique, open a small section of the bag and insert PID inlet tube to a point about one-half of the headspace depth. Exercise care to avoid uptake of water droplets or soil particles.

- Following probe insertion through foil seal or zip seal, record highest meter response as the jar headspace concentration. Maximum response should occur between 2 and 5 seconds. Erratic meter response may occur at high organic vapor concentrations or conditions of elevated headspace moisture. If this condition develops due to high organic concentrations, the concentration should be recorded as being greater than the concentration at which the erratic response began. If it is believed that headspace moisture interfered with the results, as indicated by soil visual or textural observations, a water filter should be placed on the end of the PID and an additional sample should be collected and field screened.

- Allow PID to return to ambient concentrations prior to completing subsequent measurements. If PID does not return to ambient concentrations recalibration or cleaning of the unit may be necessary.

Adapted from:

Vermont Department of Environmental Conservation (DEC) Investigation and Remediation of Contaminated Properties Procedure (IROCPP), April 2012.

Massachusetts Department of Environmental Protection (DEP) Policy #WSC-94-400, "Interim Remediation Waste Management Policy for Petroleum Contaminated Soils"

Soil Sample Collection and Decontamination Procedures

Soil Sample Collection

Soil samples collected for laboratory analyses will be collected using appropriate sample containers, as provided by the receiving laboratory. Precleaned containers shall be requested from the laboratory that meet the requirements in "Specifications and Guidance for Contaminant-Free Sample Containers", EPA540/R-93/051, PB93-963316, December 1992. Prior to sampling, all sampling utensils shall be decontaminated in accordance with the procedures outlined in the section to follow, "Decontamination Procedures".

Samples obtained for volatile organic compound (VOC) toxicity characteristic leaching procedure (TCLP) analysis will be collected as grab samples in 4 ounce wide-mouth clear glass jars with teflon septa lids, or in bottles provided by the accepting laboratory. Samples will be collected in a manner to limit VOC losses; for example, no mixing of the VOC soil sample will occur and minimum air exposure will be permitted. VOC samples will be collected first followed by the sampling for additional analyses. Refer to the following section titled "Soil Sample Collection for Total VOCs and TPH-GRO via USEPA Method 8260/5035" for information regarding sampling of total VOCs and TPH-GRO

Soil samples collected for additional analyses (non-VOC) will be collected in bottles provided by the accepting laboratory. Preservation for soil samples will include placement on ice in a cooler for shipment to the laboratory.

During all soil sampling, the following general procedures will be followed:

- Field screening and visual inspection to identify the soil to be collected for laboratory analyses;
- Obtain the most representative, homogeneous sample as possible. If collecting for VOCs, minimize soil disturbance to limit VOC losses. All sampling tools will be pre-cleaned stainless steel. As appropriate, soil samples will be composited in clean stainless steel bowls;
- Remove all large stones from the soil sample (greater than 1/4-inch);
- Place the sample into the laboratory-supplied container. Sample shall be packed as tightly as possible to remove air pockets;

- Clean threads of jar and place teflon lid on tightly. Care shall be taken not to trap soil grains within the threads of the jar and lid;
- Label and preserve the sample as discussed in the section "Sample Handling, Documentation and Chain-of-Custody requirements";
- Discard outer protective gloves between each sample event; and
- Decontaminate samples tools as described in the section, "Decontamination Procedures".

Soil Sample Collection for Total VOCs via USEPA Method 8260/5035

Samples obtained for total VOC or TPH-GRO analysis will be collected as grab samples in 40 mL methanol preserve vials. Methanol shall be pre-weighed from the laboratory. Between 5 to 25 grams of soil should be collected. The desired ratio of grams soil/mL methanol is 1:1, within a tolerance of +/-25%, however, the soil must be completely immersed in methanol. An additional sample of (unpreserved) soil must be collected to allow for a determination of moisture content, and the normalization of data to a dry-weight basis. Samples will be collected in a manner to limit VOC losses; for example, no mixing of the VOC soil sample will occur and minimum air exposure will be permitted. VOC samples will be collected first followed by the sampling for additional analysis. The collection procedure will be as described below as transcribed from Endyne, Inc. Laboratory Services instructions.

Collection of Samples for Analysis

Soil Sampling for total VOCs will be as follows:

1. Inspect the 40 mL methanol preserve vial. Each vial will contain a five character identification number which will correspond to a specific weight of methanol as prepared by the laboratory (approximately 10 mL of methanol). Each vial also contains a line indicating the initial meniscus of the methanol. Ensure that the line matches the methanol meniscus. If they do not match, do not use that vial.
2. Collect approximately 10 grams of soil, which typically corresponds to ¾ to one inch of soil.
3. No soil should be left on the outside of the vial, the threads of the screw, or the screw to cap. Add the soil so that no methanol is splashed out of the container. If methanol is lost during the sampling, the analysis will not be accurate. In this instance, discard the vial and use a new one. At this point, return to bullet number 1 and repeat the soil collection procedure.
4. Screw the cap onto the vial and check that the seal is secure. Swirl the methanol inside the vial so that the methanol covers the top of the soil. Mark the new meniscus with a permanent marker.

5. Using a four ounce or larger pre-cleaned, non-preserved glass jar, fill the jar to the top (a plastic syringe need not be used) using a pre-cleaned or disposable scoop. Ensure that the threads of the jar and cap are free of soil prior to screwing on the cap. This non-preserved sample will be submitted to the laboratory for moisture determination. This jar shall have the same sample identification number as the methanol preserved vial it corresponds to.
6. If possible, the samples shall be chilled to 4° C before packing them in the cooler.
7. Vials shall be wrapped in bubble wrap to ensure that they do not break during transportation. Ice packs or bagged ice shall be placed in between and on top of all samples after they are placed in a cooler. The temperature within the cooler shall be maintained at 4 degrees C. If not stored in a refrigerator dedicated to the storage of samples, all samples will be picked up or delivered to the laboratory within 24-hours of their collection.

Soil Sample Preservation

Samples will be collected in pre-cleaned glass containers and stored in cool conditions (approximately 4°C). After collection, samples will be promptly placed in a cooler with ice packs to preserve the samples; no chemical preservative will be added. Samples will be submitted on the same day of collection to a Vermont-certified laboratory for chemical analysis. The samples will remain refrigerated at the laboratory until analysis.

Decontamination Procedures

The method of choice for decontamination should be that which most fully removes site contaminants from the sampling equipment with least interference to the ultimate chemical analysis. Site and weather conditions frequently impose constraints upon the preferred method. Excavation contractor will be responsible for decontaminating excavation equipment.

The general decontamination methods and compounds that can be used are as follows:

- Equipment to be utilized in the collection of samples for metals analysis should be cleaned by the following steps:

    1. Wash equipment with a non-phosphate detergent solution (e.g. Alconox) and a brush.
    2. Rinse thoroughly with tap water.

- Equipment to be used for collection of samples for TPH, oil identification, and oil and grease analyses should be cleaned by the following steps:

    1. Wash equipment with a non-phosphate detergent-solution (e.g. Alconox) and a brush.
    2. Rinse with tap water.
    3. Rinse with reagent grade methanol.
    4. Rinse thoroughly with deionized water.
    5. Repeat this at each location.

- Equipment to be used for collection of semi-volatile organics (which include base-neutral extractables, PCBs, herbicides and pesticides) should be cleaned by the following steps:

    1. Wash equipment with a non-phosphate detergent-solution (e.g. Alconox) and a brush.
    2. Rinse with tap water.
    3. Rinse with technical grade acetone.
    4. Rinse with pesticide grade hexane.
    5. Rinse thoroughly with deionized water.
    6. Repeat this procedure at each sampling location.

- Equipment to be used for collection of samples for volatile organics analysis should be cleaned by the following steps:

    1. Wash equipment with a non-phosphate detergent-solution (e.g. Alconox) and a brush.
    2. Rinse with tap water.
    3. Rinse with reagent grade methanol.
    4. Rinse thoroughly with deionized water.
    5. Repeat this procedure at each location.

- Steam cleaning is another acceptable technique for field decontamination.

More than one method or compound may be used in series for a particular site. In extreme cases, disposable equipment is recommended over decontamination. This is because the level of effort and costs required to adequately clean the equipment and dispose of the cleaning solutions may not be warranted.

Adapted from:
Standard References for Monitoring Wells, The Massachusetts Department of Environemtnal Protection, DEP Publication #WSC-310-91