Alternatives Analysis Report

Former Labelon Corporation Facility
10 Chapin Street
Canandaigua
Ontario County, New York
NYSDEC IHWDS#C835016

Prepared for:

Canandaigua Crossroads, LLC
2604 Elmwood Avenue #354
Rochester, NY 14618

June 2016
Revised May 2017

Prepared By:

MacDonald Engineering

MacDonald Land Surveying and Engineering, DPC
199 Wycliff Drive
Webster, New York 14580

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, NY 14414-9516
P: (585) 226-5353 I F: (585) 226-8139
www.dec.ny.gov

July 28, 2017

Mr. Thomas Masaschi
Canandaigua Crossroads, LLC
2604 Elmwood Avenue, #352
Rochester, NY 14618

Dear Mr. Masaschi;

Re: Former Labelon Corp. Facility, Site #C835016
Alternatives Analysis Report
May 2017
City of Canandaigua, Ontario County

The New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH; collectively referred to as the Departments) have completed their review of the Alternatives Analysis Report (the Report) dated May 2017 and prepared by MacDonald Land Surveying and Engineering, DPC for the Former Labelon Corp. Facility site located in the City of Canandaigua, Ontario County.

The proposed remedy is a Track 4: Restricted Use remedy and is referred to as the Excavation with Enhanced Bioremediation and Vapor Mitigation Remedy. The Elements of the Proposed Remedy are provided in Attachment 1.

The Remedial Action Objectives (RAOs) in the final Decision Document may slightly differ from the RAOs in the Report. It is also expected that a soil vapor RAO will be added to mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

The Report includes some preliminary design information. These items are appropriate for preliminary cost estimates, but the final details will be addressed in the Remedial Design. Items of specific concern include, but are not necessarily limited to, the following:

- The Departments do not necessarily agree that 10 ppm is an appropriate PID screening criteria for soils contaminated with chlorinated solvents. Regardless of the screening criteria, soils that screen as ‘clean’ will still be sampled and analyzed prior to reuse.
- The number of post-excavation confirmatory soil samples appears appropriate for initial cost estimates; the final number of samples will be based on the actual size of the excavations.
- The number of post-remediation groundwater sampling locations appears appropriate for initial cost estimates; the specific wells that are sampled will be provided in the Remedial Design. Additionally, the Departments agree that quarterly groundwater monitoring is appropriate for two years. The Departments do not necessarily agree that annual

monitoring will be acceptable after two years. Long-term groundwater monitoring requirements will be addressed in the Site Management Plan.

- In the SS-03 area, the cover may consist of paved surface parking areas, sidewalks, or a soil cover. If a soil cover is used it will consist of a **minimum** of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer.

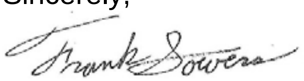
Please attach this letter and all attachments to the front of the Report and place copies in the document repositories established for the site.

Please distribute copies of the Report as follows:

- Frank Sowers (NYSDEC) – 1 paper copy and 1 complete electronic copy on CD attached
- Julia Kenney (NYSDOH) – 1 paper copy and 1 complete electronic copy on CD attached; and
- Wood Library (document repository)- 1 paper copy and 1 complete electronic copy on CD attached;

Thank you for your cooperation in this matter and please contact me at 585-226-5357 or frank.sowers@dec.ny.gov if you have any questions.

Sincerely,



Frank Sowers, P.E.
Professional Engineer 1

Enclosure:
Attachment 1 – Elements of the Proposed Remedy

ec: w/Encl
B. Conlon
B. Schilling
J. Kenney
J. Deming
A. Knauf
G. Andrus
D. MacDonald
R. Hutteman
M. Cruden
K. Kane
T. McVickers
B. Cillian

ATTACHMENT 1

Former Labelon Corp. Facility
Brownfield Cleanup Program
City of Canandaigua, Ontario County
Site No. C835016
July 2017

ELEMENTS OF THE PROPOSED REMEDY

The proposed remedy is referred to as the Excavation with Enhanced Bioremediation and Vapor Mitigation Remedy.

The estimated present worth cost to implement the remedy is $225,000. The cost to construct the remedy is estimated to be $205,000 and the estimated average annual cost is $7,500.

The elements of the proposed remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

Unsaturated soils in the Area B source area which exceed the site-specific soil cleanup objectives (SCOs) described below will be excavated to the extent feasible:

- 6 NYCRR Part 375 Restricted Residential SCOs for VOCs and SVOCs;
- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- soil with visual waste material or non-aqueous phase liquid; and
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

Approximately 38 cubic yards of contaminated soil will be removed from the site.

Excavation and removal of any underground storage tanks (USTs), fuel dispensers, underground piping or other structures associated with a source of contamination.

On-site soil which does not exceed the above excavation criteria or the protection of groundwater SCOs for any constituent may be used anywhere beneath the cover system, including below the water table, to backfill the excavation or re-grade the site.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the site.

3. Cover System

A site cover will be required to allow for **restricted residential** use of the site in areas where the upper **two feet** of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). The site cover may consist of paved surface parking areas, sidewalks, or a soil cover. Where a soil cover is to be used it will be a minimum of **two feet** of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d). In areas where building foundations or building slabs preclude contact with the soil, the requirements for a site cover will be deferred until such time that they are removed.

4. Enhanced Bioremediation

In-situ enhanced biodegradation will be employed to treat contaminants in groundwater in the Area A chlorinated VOC source area under the building, the Area B chlorinated VOC source area at the southwest corner of the building, on-site areas within the associated groundwater contaminant plumes, and at the downgradient site boundary as depicted on **Figure 9a** of the Alternatives Analysis Report. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by injecting electron donor reagents into the overburden in source Area A, the on-site plume areas, and near the downgradient site boundary to control contaminant migration and promote microbe growth via injection wells screened from approximately 4 to10 feet. The electron donor reagent will be placed and mixed within the source Area B excavation described in remedy element #2. Liquid activated carbon™ will also be injected near the downgradient site boundary to control contaminant migration.

5. Vapor Mitigation

Existing on-site buildings will be required to have a sub-slab depressurization system, or other acceptable measures, to mitigate the migration of vapors into the building from soil and/or groundwater.

6. Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a Track 4 restricted residential cleanup at a minimum and will include an environmental easement, and site management plan as described below.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for restricted residential use, or commercial use or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 7 above.

Engineering Controls: The cover system discussed in Paragraph 3 and the sub-slab depressurization system discussed in Paragraph 5.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision for removal or treatment of the source area located under the existing on-site building if and when the building is demolished or becomes vacant;
- descriptions of the provisions of the environmental easement including any land use and/or groundwater water use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 3 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of soil, groundwater, soil vapor, sub-slab soil vapor, and indoor air to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any occupied existing or future buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation systems. The plan includes, but is not limited to:

- procedures for operating and maintaining the systems; and
- compliance inspection of the systems to ensure proper O&M as well as providing the data for any necessary reporting.

Table of Contents

Contents

Figures

Analytical Tables

Alternatives Cost Estimate Tables

Appendices- Refer to Supplemental Remedial Investigation Report, June 2016, Revised May 2017

List of Acronyms

Acronym	**Definition**
ALTA	American Land Title Association
AOC	Areas of Concern
ASL	Above Sea Level
AST	Aboveground Storage Tank
BGS	Below Ground Surface
COC	Contaminants of concern
cVOC	Chlorinated Volatile Organic Compound
CY	Cubic Yards
DCE	Dichloroethene
DER	Division of Environmental Remediation
DUSR	Data Usability Summary Report
EBS	Environmental Baseline Survey
ES	Engineering Science
FWRIA	Fish and Wildlife Resources Impact Analysis
GPS	Global Positioning System
HSDB	Hazardous Substance Data Bank
IHWDS	Inactive Hazardous Waste Disposal Site
ISCO	In-situ chemical oxidation
kg	kilogram
L	liter
mg	milligram
MIP	Membrane Interface Probe
MNA	Monitored Natural Attenuation
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ODC	Ozone Depleting Compound
OGL	Organix Green Liquid
OM&M	Operations, Monitoring and Maintenance
ORC	Oxygen Releasing Compound
OSWER	October 1988-Office of Solid Waste and Emergency Response
OU	Operable Units
PCB	Polychlorinated biphenyl
PHC	Petroleum hydrocarbons
PID	Photoionization Detector
ppb	Parts Per Billion
ppm	Parts Per Million

PSA	Preliminary Site Assessment
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SCG	Standards, criteria, and guidance values
SCOs	Soil Cleanup Objectives
STARS	Spill Technology and Remediation Series
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
TCL	Target Compound List
TIC	Tentatively Identified Compound
TOGS	NYSDEC Technical and Operational Guidance Series 1.1.1
µg	microgram
UST	Underground Storage Tank
VC	Vinyl Chloride
VOC	Volatile Organic Compound

Certification

I, Robert J. Hutteman, certify that I am currently a NYS registered Professional Engineer as defined in 6 NYCRR Part 375 and that this Alternative Analysis Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER approved modifications.

__________________________________ Signature of Environmental Professional

5-3-17

1.0 Executive Summary

This Alternatives Analysis (AA) Report was prepared by MacDonald Land Surveying and Engineering (MLSE) on behalf Canandaigua Crossroads, LLC (CC) for the Former Labelon Corporation Facility (herein after referred to as the Site). The property is located at 10 Chapin Street in the City of Canandaigua, Ontario County, New York. The AA was prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) approved Remedial Investigation Work Plan (RI) and the Supplemental Remedial Investigation Work Plan for the Site and incorporates information generated during the RI.

Canandaigua Crossroads envisions the future use of the Site to be for mixed commercial – residential use (e.g. commercial first floor with residential and office space above).

The Site is located at 10 Chapin Street, City of Canandaigua, Ontario County, New York (Figure 1a). The property includes approximately 1.63 acres and contains a four (4)-story masonry/brick building with a total floor area of 79,800 square feet. Undeveloped portions of the Site include crushed stone and asphalt parking areas and driveways. Figure 1b outlines the Brownfield Cleanup Project (BCP) Site Boundary and Figure 2 is a Site Plan providing an overview of the facility layout.

The Site has been used for various commercial and industrial purposes since the late 1800s. Reported historic use of the Site includes a coal yard (from the 1880s to 1910s), a corset factory (from the 1920s to 1940s), and a bicycle factory (from the 1940s to 1950s). Labelon Corporation then occupied the Site from approximately 1960 to 2002, manufacturing transparency films and adhesive labels.

Various areas of soil and groundwater have been documented with environmental impacts. Analytical laboratory results for soil and groundwater were compared to Soil Cleanup Objectives (SCOs) referenced in the New York State Department of Environmental Conservation (NYSDEC) document titled "*6 NYCRR Part 375, Environmental Remediation Programs*" dated December 14, 2006. Specific SCOs the data were compared to include Unrestricted SCOs, Restricted Residential Use SCOs, and Protection of Groundwater SCOs for volatile organic compounds (VOCs).

Contaminants detected in soil and groundwater include petroleum constituents, chlorinated solvents, barium and silver. These compounds are likely related to the various activities that took place on the property during its past industrial use. These activities included solvent storage and mixing, silver use and mixing, and underground storage of petroleum. Specific areas of environmental impact are summarized in the following subsections.

1.1 TCE Impacted Areas (Soil)

Trichloroethylene (TCE) is the predominant contaminant detected in soil and groundwater at the site. Groundwater elevation contour mapping is provided in Figures 3a and 3b (Groundwater Contour Map(s) 2015 and 2016). The occurrence of TCE and related breakdown compounds in soil and groundwater is illustrated in Figures 4a and 4b, respectively (Soil and Groundwater Analytical Results Plan(s)-Exceedances), Figure 5 (Sample Locations Peak PID Readings), Figure 6 (Trichloroethene Soil Results), Figure 7 (Soil Cross Section), Figure 8a (Trichloroethene Groundwater Results 2015), and Figure 8b (Trichloroethene Groundwater Results 2016). Contaminated soils are largely concentrated in two (2) operable units including one (1) beneath the center of the southern building footprint (Area A) in the vicinity of GP-21, 21-D and 27 and the other located east of the MW-201 well cluster (Area B). Refer to Figure 6, Figure 9 (Alternative #2), and Figure 9b (Alternative #3) for a representation of Areas A and B.

The TCE source for Area A coincides with the former machining area where cutting oils containing the compound were likely used. It is estimated that approximately 82 cubic yards (~ 140 tons) of TCE-impacted soil above the Restricted-Residential cleanup standard (21 ppm) exists beneath the concrete slab in this source area.

It appears likely that TCE-impacted soils and groundwater in Area B were caused by cleaning parts outside and/or draining floor cleaning liquids to the parking area in this location. It is estimated that approximately 38 cubic yards (~ 65 tons) of TCE-impacted soil is above the Restricted-Residential cleanup standard.

For the purposes of evaluating soils in comparison to the groundwater protection standard, the total cubic yards for Areas A and B were calculated together (quantities shown on Figure 6, Figure 9a, and Figure 9b). The estimated area of TCE-impacted soil above the groundwater protection standard is approximately 816 cubic yards .

1.2 Petroleum Tank (Southwest Building Corner)

There is a petroleum tank located on the southwest corner of the building. This tank is identified as a source for petroleum compounds (xylene, ethylbenzene, and toluene) that have been documented in soils and groundwater in the vicinity. To benefit redevelopment of the site and address petroleum impacts on soil and groundwater, this tank will be properly closed and removed from the Site.

1.3 Groundwater Impacts

TCE-impacted groundwater has been documented at 2016 concentrations as high as 2,630 ug/l beneath the building and 1,930 ug/l beneath the parking area to the west (see Figures 8a and 8b). For the purposes of groundwater cleanup alternatives analysis, these areas were addressed as one (1) operable unit to best meet the protection of groundwater standard (0.470 ppm). Based on the environmental studies to date, the TCE Plume on the property covers between 3,100 and 3,700 square feet (estimated 0.085 acres). Based on lower analytical concentrations observed in other wells installed at deeper depths on the site, it appears that dense material has limited vertical migration.

Groundwater at the Site generally flows to the south/southwest. Figures 3a and 3b provide groundwater contours based on groundwater elevations collected in 2015 and 2016.

1.4 Potentially Exposed Population and Exposure Routes

The Site is largely covered by a four (4)-story building with a parking area along the western boundary and northwest quadrant of the property. Environmental impacts are in subsurface soils and groundwater currently covered by crushed stone or the building. Potential exposures to surface soil by trespassers do exist because the parking lot adjacent to the Site's building is used as a thoroughfare for pedestrians. It is noted that elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) in exceedance of applicable Site SCOs were found in a surface soil sample (SS-03). It is noted that sample SS-03 was located in an area of maintained lawn where direct human exposure is not considered likely.

Groundwater is not used as a source of potable or non-potable water at the Site. Under these current conditions, no complete exposure pathways are identified on-site; thus, it is unlikely that the general public has a potential to be exposed to contaminants on the Site. However, if corrective actions are not implemented, the following complete exposure pathways for receptor populations may exist on-Site during or after redevelopment of the Site:

- Construction workers and the surrounding community may have the potential to be exposed to Site contaminants via inhalation, direct dermal contact and ingestion of site contaminants during activities that involve disturbance of contaminated media (soil, fill or groundwater);

- On-Site occupants may have the potential to be exposed to Site contaminants via inhalation from soil vapor intrusion (SVI) into the buildings; and

- SVI is also concern for off-Site adjoining properties, especially for the properties west of the Site due to the west/southwestward hydraulic gradient. Off-Site occupants and the community may have the potential to be exposed to Site contaminants through inhalation from SVI.

1.5 Evaluation and Selection of Recommended Remedial Alternative

Remedial goals, objectives, and consideration factors were developed in order to prepare the remedial alternatives. Evaluation criteria were then developed in order to evaluate and compare the remedial alternatives. The alternatives, presented below, are directed at addressing Site contamination in soil, fill, and groundwater, and these alternatives are presented below. The alternatives consider that the Site will be used for mixed commercial/residential purposes (e.g., commercial first floor with residential above).

1. No Action: A no action alternative is a NYSDEC Brownfield Cleanup Program (BCP) procedural requirement, and provides a baseline to evaluate other alternatives. Under this alternative, remedial and monitoring activities as well as placement of institutional controls or engineering controls at the Site are not implemented. Environmental conditions at the Site would essentially remain as they are, and future use of the Site would not be limited.

2. Impacted Removals; In-Situ Groundwater Remediation; Institutional Controls; Engineering Controls; and Groundwater Monitoring: Remediation would consist of an Interim Remedial Measure (IRM) involving the removal and off-site disposal of areas of highest impacted soil above soil cleanup criteria for the Site. The on-site petroleum tank would also be removed along with petroleum impacted soils as possible. This IRM includes removal of contaminated soil above the groundwater table (except for below the building slab) in the TCE source area. It is anticipated that some TCE contaminated soil would remain in-place subsequent to the IRM. In-situ groundwater remediation would then be conducted to assist in remediation of residual VOC groundwater contamination above cleanup criteria in the overburden. The remaining contaminants in soil and groundwater (e.g., metals, residual VOCs) would be addressed via institutional controls (e.g., Environmental Easement and Site Management Plan) and engineering controls (e.g., soil vapor mitigation system, cover system). A groundwater monitoring program would be implemented to evaluate the effectiveness of the remedy. This alternative is considered a Track 4 cleanup to allow for mixed residential and commercial use of the Site.

3. Full Removal of Impacted Fill Material, Soil and USTs, Groundwater Remediation; and Groundwater Monitoring: Excavation and off-site disposal would be implemented to completely remediate impacted soils (where accessible) that exceed NYSDEC Track 1 SCOs and allows for unrestricted use of the Site. The on-site petroleum tank would also be removed along with petroleum impacted soils as possible. Contaminated groundwater that exceeds Track 1 SCOs in overburden and also bedrock that are not affected by the excavation dewatering would be addressed by in-situ remediation. Groundwater monitoring would be implemented to evaluate the effectiveness of the remedy. This alternative is considered a Track 1 cleanup to allow for unrestricted use of the Site.

The proposed recommended remedial alternative is based on the results of the Remedial Investigation (RI) and the evaluation of alternatives presented herein. A detailed evaluation of the three (3) remedial alternatives was performed and implementation of Alternative #2 (Impacted Soil Removals; In-Situ Groundwater Remediation; Institutional Controls; Engineering Controls; and Groundwater Monitoring) is recommended for the Site. Alternative #2 would achieve the remediation goals for the Site by:

- Removing contaminated soil/fill;
- Removing the in-place petroleum UST;
- Treating contaminated groundwater;
- Controlling exposure to residual contamination through the use of institutional controls and engineering controls;
- Creating conditions that restore groundwater quality to the extent practicable; and
- Monitoring of groundwater to evaluate the effectiveness of the remedy.

Alternative #2 satisfies the threshold criteria and provides the best balance with the primary balancing criteria identified in Section 3.5. Alternative #2 is an acceptable alternative, can be implemented easily in relation to future use of the Site, and costs less than Alternative #3.

The proposed remedy for the Site is soil excavation and subsequent groundwater treatment with bioremediation using Regenesis, Inc. Hydrogen Release Compound® (HRC®). Soil excavation is the most efficient method to remove the petroleum-impacted soil surrounding the identified UST and can also mitigate a majority of the TCE contamination present in the southwestern portion of the parking lot. Bioremediation is a proven, cost-effective solution that would serve to address residual soil and groundwater contaminants beneath the Site building and remaining residual impacted soils in the southwestern parking lot. Once accessible soils have been removed by excavation, bioremediation will facilitate sustained microbial degradation of chlorinated solvents and immobilize the known plumes.

2.0 Introduction and Background

MLSE has prepared this AA Report for CC for submission to the NYSDEC Region 6 Division of Environmental Remediation in accordance with the Brownfield Cleanup Program (Title 6 NYCRR Part 375, and DER-10 "Technical Guidance for Site Investigation and Remediation."

CC used private funds to characterize and assess environmental conditions at the Former Labelon Corporation Facility located in Canandaigua, New York. CDM Smith was contracted by the United States Protection Agency (USEPA) to partially implement the *Remedial Investigation Work Plan, November 2011,* by SAW Environmental, Incorporated and the *Supplemental Remedial Investigation Work Plan, January 2015* by MLSE. MLSE was contracted by CC to complete the remaining portions of the RI. The details of the work performed are discussed in the Remedial Investigation Report.

2.1 Site Location and Description

The Site is located at 10 Chapin Street, City of Canandaigua, New York (Figure 1). The property includes approximately 1.63 acres and contains a four (4)-story, currently unoccupied, masonry/brick building with a total floor area of 79,800 square feet. Undeveloped portions of the Site include crushed stone and asphalt parking areas and driveways. The Site is bounded to the east and south by commercial properties. Canandaigua City Hall is located to the north and residences are located to the north, and west of the Site.

2.2 Site History

All structures on the subject Site are attached, but were reportedly built in stages. The original building, constructed prior to 1924 (CDM Smith, 2013), is the southernmost structure on the property and is located on the north side of Chapin Street. The remaining portions of the structure, including up to three (3) additions, were constructed after 1924, north of the original building. Reported historic use of the Site include a coal yard (from the 1880s to 1910s), a corset factory (from the 1920s to 1940s), and a bicycle factory (from the 1940s to 1950s). Labelon Corporation then occupied the Site from approximately 1960 to 2002, manufacturing transparency films and adhesive labels.

Contaminants detected in environmental media on Site, including petroleum constituents and chlorinated solvents are likely related to the various activities that took place on the property during its past industrial use. These activities included solvent storage and mixing, silver use and mixing, and underground storage of petroleum and potentially other industrial liquids. It is also noted that the property is located in an urban setting and other commercial/industrial properties have been and/or are currently located in the immediately surrounding area of the Site.

2.3 Site Environmental Concerns and Impacts

MLSE has reviewed currently available documentation relative to the environmental history of the Site and the various assessments and investigations that have been completed relative to the property since 1989. Section 1.3 of the CDM Smith Phase II Assessment Report (Appendix 4) provides a comprehensive discussion of previous assessment, investigation and remedial efforts.

2.4 Remedial Investigation

The Remedial Investigation effort completed under the approved SAW RIWP (Appendix 1) was divided among a total of seven (7) areas of concern (AOCs) including the following:

AOC 1 - Pipes, Drains and Unknown Structure (Potential Drywell)
AOC 2 - Not Specified
AOC 3 - Former underground storage tanks (USTs)

AOC 4 - Solvent Mixing Room
AOC 5 - Silver Mixing Rooms
AOC 6 - West of Building
AOC 7 - Main Site Building Interior

These areas were evaluated to the extent possible from the exterior of the Site building with the exception of a passive soil vapor survey that identified a potential source area for cVOC contamination beneath the southern portion of the building interior. Exterior sampling of subsurface soils and groundwater confirmed the presence of cVOCs at levels exceeding applicable 6NYCRR Part 375 Restricted-Residential SCOs and 6NYCRR Part 703 Class GA Groundwater Standards, respectively. The CDM Smith report provides a complete record of the exterior investigation findings. The primary recommendation from the CDM report is the completion of the interior subsurface investigation. The RI completed by MLSE in 2016 provides a more comprehensive picture of the nature and extent of contamination found at the Site.

In August 2014, MLSE was retained by CC to resample nested well pairs located to the southwest of the building including MW-201(S&D) and MW-202 (S&D) using passive diffusion bags (PDBs). This sampling event was suggested by the NYSDEC as a potential means of ruling out the possibility of substantial downward migration of cVOCs into bedrock. A copy of the report documenting this sampling event is provided as Appendix 5. It is noted that TCE was detected in MW-201S and MW-201D at 3,940 µg/L and 1,740 µg/L, respectively, indicating the potential for lower levels of cVOCs at greater depths. However, the NYSDEC requested that a single bedrock monitoring well be installed in the immediate vicinity of the MW-201 well pair to more conclusively determine whether cVOC contamination is present in bedrock at levels requiring remedial action. A deeper well, MW-201D2, was installed in this location as part of this RI. However, bedrock was not encountered during the well installation.

MLSE prepared and implemented a Supplemental Remedial Investigation Work Plan (Appendix 2) in February 2015. Investigation activities occurred in February and March 2015 and May 2016 (Figure 2) and included the following primary tasks:

- Asbestos abatement to allow for unrestricted access beneath the building footprint;
- Geophysical survey to scan the subsurface interior of the building;
- Completion of building interior and exterior soil borings;
- Installation and development of wells;
- Groundwater sampling of existing and newly installed wells
- PCB sampling from the building interior;
- Water depth and hydraulic conductivity measurements for the wells (Appendix 6);
- Completion of four (4) test pit excavations to investigate suspected Site USTs;

- Investigation of the boiler room and northwest loading dock; and
- Surface soil sampling across the Site.

Results of the RI activities are summarized in the following section.

2.5 Nature and Extent of Contamination

In this section, laboratory analytical results from current and previous RI activities (as applicable) are compared to the appropriate published standards, criteria, or guidance values as indicated below. A summary of the analytical results produced during this RI is included as Tables 1 through 5.

2.6 Soil

Soil sample analytical results are compared to the NYSDEC Protection of Public Health (Restricted-Residential) and Protection of Groundwater SCOs in 6 NYCRR Part 375-6.8(b) (effective December 14, 2006). The property is planned for mixed use; first floor commercial and second floor (and above) residential use.

The occurrence of cVOCs soil contamination is illustrated in Figures 4a, 5, 6 and 7. Contaminated soils are concentrated in two (2) areas (discussed herein relative to soils as "Areas A and B". These areas specifically include one (1) beneath the center of the southern building footprint (Area A) in the vicinity of GP-21, 21-D and 27 and the other located east of the vicinity of the MW-201 well cluster (Area B). Refer to Figure 6 for a representation of the Areas. In May 2016, analytical soil sampling was conducted in association with the MW-201 well cluster. Elevated VOC concentrations in the location of MW-201 well cluster are concurrent with the Beacon vapor map (watermark) and Figure 5.

Based on PID, analytical, and past soil vapor data relative to subsurface soil conditions, the presence of cVOC in soils beneath the building and to the west appear to represent the soils on the Site with the potential to continue to leach VOC contaminants into groundwater over time. Analytical sample results indicate that Protection of Groundwater SCOs are exceeded in this portion of the property. Tables 1, 2, and 3 present soil analytical results.

Figure 4a indicates the location of applicable regulatory exceedances for Restricted-Residential use criteria for surface and subsurface soils. Exceedances in SVOCs were detected in the surface soil sample SS-03. A Restricted-Residential exceedance for chromium was detected in GP-32 (at 4 feet bgs) and a Restricted-Residential exceedance was also found for barium in GP-7 (at 4 feet bgs). It is noted that barium is also a Site contaminant of concern. Such elevated levels of barium may be attributed to the former industrial uses of the Site.

PID readings were also taken from various features within the building. These readings are indicated in the field notes provided in Appendix 6. No other findings of significance were observed in the PID readings taken from features other than soil boring locations.

Past petroleum storage and use locations, including the former boiler room (interior and exterior), the northern loading dock, and the southwestern building entrance were investigated in May 2016. Four (4) test pits were excavated by Trec Environmental, Inc. on May 3 and May 5, 2016 to determine the existence of suspected USTs. A UST with an estimated capacity of 200 gallons was identified on the exterior southwest corner of the building at TP-01. Peak PID readings were 300 ppm from the soil surrounding the tank and 700 ppm at the fill port of the tank. An odor indicated that the tank contains gasoline and analytical data showed exceedances in benzene, toluene, ethylbenzene, and xylene (BTEX) compounds and TCE.

TP-02, excavated on the exterior west side of the building adjacent to the former boiler room, indicated no UST. Furthermore, no UST was found when the interior (within the former boiler room) of TP-02 was excavated to an approximate depth of 5 feet. TP-03, located at the northwest loading dock of the building, showed no UST inside or outside of the building at this location. It is noted that the interior investigation at TP-03 revealed two (2) concrete floors and the end of the UST piping could not be found without extensive structural damage to the building. TP-04 was excavated southwest of the found UST at TP-01 and a 4-inch cast iron pipe was discovered with a peak PID reading of 1.8 ppm; no UST was discovered at TP-04. The location of all test pits and findings are indicated on Figure 4a and Figure 5.

It should be noted that, as discussed in the CDM Smith Report provided as Appendix 4, 15 chemical storage USTs and associated contaminated soils were removed from the property in September 1990. It is inferred that past chemical storage has been eliminated as an area of the subject Site requiring significant additional investigation or remedial effort.

2.7 Groundwater

Groundwater analytical results are compared to the NYS Class GA Groundwater Quality Standards in 6 NYCRR Parts 700-705 (NYS, 1999b) and guidance values in the NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1 NYSDEC, 1998).

The distribution of Site groundwater contamination is best illustrated by Figures 4b, 8a, and 8b. The location of groundwater contamination is generally consistent with the soils findings; with the majority of the contamination centered in the southern portion of the building and parking area to the west. It is apparent that cVOCs in groundwater are migrating westward along the established west/southwestward hydraulic gradient on the Site.

The results of the differential groundwater depth sampling conducted in August 2014 (MW-204 and 201 well pairs) as well as the February 2015 sampling of MW-201D2 suggest that substantial downward migration of cVOC is not occurring. The lower hydraulic conductivity observed at MW-201D2 relative to the shallower wells tested (MW-201S and 200S) also supports the inference that shallow overburden groundwater contains the bulk of the contamination with the potential to migrate.

In addition to chemical analyses, microbial groundwater sampling conducted from GP-24 indicates that dehalococcoides bacteria are present in the subsurface at the Site and degrading TCE into its daughter products. Groundwater analytical results are presented in Tables 4-5 and laboratory analytical data reports are attached as Appendix 7.

2.8 Proposed Future Use of Site and Adjoining Properties

The conceptual future use of the Site includes redevelopment for a combination of commercial and residential use.

2.9 AA Objective

The objective of the AA is to identify, evaluate and select a remedy to address identified contamination at the site.

3.0 Remedial Goals, Objectives, Consideration Factors, and Evaluation Criteria

Remedial goals, objectives and other factors to consider are provided in this section of the AA.

3.1 Cleanup Goals

Standards, Criteria and Guidance (SCG) values to allow for mixed residential and commercial use are considered in this AA. The SCGs assist in defining the extent of contamination requiring remediation, and also are used to evaluate the effectiveness of the remedy. The SCGs for soil, groundwater and soil vapor intrusion to be used for this project are provided below.

- Analytical laboratory results for groundwater will be compared to groundwater standards and guidance values referenced in the NYSDEC document titled "*Division of Technical and Operational Guidance Series, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*" (TOGS 1..1.1) dated June 1998 as amended by April 2000 and June 2004 Addendums.
- Analytical laboratory results for soil and fill will be compared to SCOs referenced in the NYSDEC document titled "*6 NYCRR Part 375, Environmental Remediation Programs*" dated December 14, 2006. Specific SCOs to be considered will include Unrestricted SCOs, Restricted-Residential Use SCOs and Protection of Groundwater SCOs.

3.2 Remedial Action Objectives

Remedial Action Objectives (RAOs) are medium-specific objectives for the protection of human health and the environment. RAOs for this project are as follows:

3.2.1 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure from, contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

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

3.2.2 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of groundwater contamination.

3.3 Other Factors for Consideration

For this project, the following additional considerations were evaluated during the development of remedial alternatives:

- Eliminate or mitigate threats to public health and the environment.
- Address source areas of contamination using the following hierarchy in order of preference:
  - Removal and/or treatment;
  - Containment;
  - Elimination of exposure; and
  - Treatment of source at point of exposure.

- Give preference to permanent closure of abandoned underground storage tanks via removal over closure of tanks in-place. This preference is intended to maximize redevelopment options at the Site, and also result in a higher level of confidence that associated contamination or tank contents are properly addressed as part of the remedy.

Protect groundwater considering the following:

- Source removal, treatment or control;
- Restoration of groundwater quality to meet applicable SCGs to the extent practicable; and
- Plume containment/stabilization.

Prevent soil vapor intrusion into structures:

- Implement a monitoring plan to evaluate the potential for exposure relative to soil vapor intrusion;
- Conduct supplemental remedial actions to address soil or groundwater volatile contamination that has the potential to partition to soil vapor; and
- Implement engineering controls to address soil vapor intrusion (e.g., sub-slab depressurization system, etc.).

3.4 Contaminants of Interest

Based on studies performed to date, the contaminants of interest are primarily comprised of:

- Chlorinated VOCs (predominantly TCE) in soil, soil vapor, and groundwater;
- Petroleum-related VOCs and SVOCs (including PAHs) in soil in proximity to the identified UST; and
- Barium in soil.

3.5 Development of Remediation Criteria

In order to evaluate the effectiveness of remedial alternatives for this Site, the following general and Site-specific remediation criteria (i.e., threshold criteria) were developed in accordance with the provisions set forth in DER-10. The first two (2) evaluation criteria listed below are threshold criteria and must be satisfied in order for an alternative to be considered for selection. The subsequent evaluation criteria are primary balancing criteria which are used to compare the positive and negative aspects of each remedial alternative that first meets the threshold criteria:

- Protection of Human Health and the Environment: This criterion is an evaluation of the remedy's ability to protect public health and the environment, and assesses how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, engineering controls or institutional controls. The remedy's ability to achieve each of the RAOs is evaluated.

- Compliance with Standards, Criteria and Guidance Values: Compliance with SCG values address whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

- Long-Term Effectiveness and Permanence: This criterion evaluates the long-term effectiveness of the remedy after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated:
  - Whether residual contamination will pose significant threats, exposure pathways, or risks to the community and environment;
  - The adequacy of the engineering and institutional controls intended to limit the risk;
  - The reliability of these controls; and,
  - The ability of the remedy to continue to meet RAOs in the future.

- Reduction of Toxicity, Mobility and Volume: The remedy's ability to reduce the toxicity, mobility or volume of site contamination is evaluated. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the Site.

- Short-Term Impacts and Effectiveness: The potential short-term adverse impacts and risks of the remedy upon the community, the workers and the environment during its construction and/or its implementation are evaluated. This includes identification of short-term adverse impacts and health risks, the effectiveness of any engineering controls, and the length of time needed to achieve the remedial objectives.

- Implementability: The technical and administrative feasibility of implementing the remedy is evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. Administrative feasibility includes the availability of the necessary personnel and material, the evaluation of potential difficulties in obtaining specific operating approvals, access for construction, etc.

- Land Use: This criterion is intended to evaluate the remedial alternatives in relation to the planned future use of the Site.

- Cost-effectiveness: Capital, operation, maintenance and monitoring costs are estimated for the remedy and presented on a present worth basis.

- Community Acceptance. This criterion is intended to select a remedial alternative that is acceptable to the community. The public's comments, concerns and overall perception of the remedy are later addressed through the Citizen Participation Plan (CPP) that was developed under the NYSDEC approved Work Plan. The CPP provides a mechanism for the public to review and comment on project documents as the project progresses. As such, community acceptance is not discussed in this report.

3.6 General Response Actions

Estimates of the areas and volumes of contaminated media to be addressed were identified in Section 2.3.5 (Nature and extent of Contamination). These estimated areas and volumes are summarized below.

TCE Impacted Areas (Soil)
Trichloroethylene (TCE) is the predominant contaminant detected in soil and groundwater at the site. The occurrence of TCE and related breakdown compounds in soil and groundwater is illustrated in Figures 4a, 4b, 6, 7, 8a and 8a. Contaminated soils are concentrated in two (2) operable units including one (1) beneath the center of the southern building footprint (Area A) in the vicinity of GP-21, 21-D and 27 and the other located east of the MW-201 well cluster (Area B).

The TCE source for Area A coincides with a former area of the building where cutting or other oils containing the compound may have been used. It is estimated that approximately 82 cubic yards (~ 140 tons) of TCE-impacted soil above the Restricted-Residential cleanup standard (21 ppm) is located beneath the concrete slab in this source area.

It is unclear as to whether TCE impacted soils and groundwater in Area B were caused by cleaning parts outside or whether drainage from within the building was directed toward the parking area in this location. It is estimated that approximately 38 cubic yards (~ 65 tons) of TCE-impacted soil is above the Restricted-Residential cleanup standard.

Petroleum Tank (Southwest Building Corner)
There is a petroleum tank located on the southwest corner of the building. This tank is identified as a source for petroleum compounds (xylene, ethylbenzene, and toluene) that have been documented in soils and groundwater in the vicinity. To benefit redevelopment of the site and address petroleum impacts on soil and groundwater, this tank will be properly closed and removed from the site pursuant to NYSDEC regulations outlined in 6 NYCRR Part 613.9. During this process, accessible petroleum-contaminated soils will be excavated and properly disposed of. It is noted that TCE-impacted soils will likely be removed and properly disposed of as part of the UST removal and closure process. The NYSDEC's Region 8 Bulk Storage Division and City of Canandaigua will be notified of this process and appropriate permits will be obtained,

Groundwater Impacts

Groundwater within and surrounding Areas A and B has been documented as impacted by the presence of TCE and its daughter compounds. The impacts are further discussed below.

TCE is present in groundwater at concentrations as high as 2,630 ug/l beneath the building and as high as 1,930 ug/l to the west. For purposes of groundwater cleanup alternatives analysis, these areas were addressed as one (1) operable unit to best meet the protection of groundwater standard (0.470 ppm). Based on the environmental studies to date, the TCE plume surrounding Area A and Area B covers approximately 3,700 square feet (Estimated 0.085 acres). Based on lower analytical concentrations observed in other wells installed at deeper depths on the site, it appears that dense glacial till layers have resulted in only limited vertical migration.

Groundwater at the Site generally flows to the south/southwest. Figures 3a and 3b provide groundwater contours based on groundwater elevations collected in 2015 and 2016. Likewise, Figures 8a and 8b indicate the distribution of TCE and related impacts in groundwater as observed in 2015 and 2016, respectively. It is noted that concentrations of TCE were observed to be generally lower in 2016 as compared with data obtained in 2015.

Response Actions

General response actions to address the identified contamination in soil or fill can include one (1) or more of the following:

- Treatment,
- Containment,
- Excavation,
- Extraction,
- Disposal,
- Environmental engineering controls, and
- Institutional controls.

The response actions are evaluated for application in addressing soil or fill contamination that exceeds applicable NYSDEC SCOs.

General response actions to address the identified contamination in groundwater can include one (1) or more of the following:

- Treatment,
- Containment,
- Extraction,
- Disposal,

- Environmental engineering controls,
- Institutional controls, and
- Monitored natural attenuation.

The response actions are primarily evaluated for application in addressing groundwater contamination that exceeds NYSDEC TOGS 1.1.1 Groundwater Standards or Guidance Values.

3.7 Development of Alternatives

The alternatives considered for this Site are directed at addressing contamination in soil, fill and groundwater, and these alternatives are presented below. The alternatives consider that the Site will be used for mixed residential and commercial purposes.

1. <u>No Action:</u> A no action alternative is a NYSDEC BCP procedural requirement and provides a baseline to evaluate other alternatives. Under this alternative, remedial and monitoring activities as well as placement of institutional controls or engineering controls at the Site are not implemented. Environmental conditions at the Site would essentially remain as they are, and future use of the Site would not be limited.

2. <u>Impacted Soils Removal; In-Situ Groundwater Remediation; Institutional Controls; Engineering Controls; and Groundwater Monitoring:</u> Remediation will consist of soils removal and off-site disposal of areas of accessible, highest impacted soil above soil cleanup criteria for the Site. This Alternative includes removal of contaminated soil within the vadose zone and shallow groundwater (except for below the building slab) in the TCE source area. It is anticipated that some TCE contaminated soil would remain in-place subsequent to the implementation of the remedy. Therefore, in-situ groundwater remediation would be conducted to assist in remediation of residual VOC groundwater contamination above cleanup criteria in the overburden and provide containment to prevent off-Site migration.

   Remaining contaminants in soil, and groundwater (e.g., metals, residual VOCs) would be addressed via institutional controls (e.g., Environmental Easement and Site Management Plan) and engineering controls (e.g., soil vapor mitigation system, cover system). A groundwater monitoring program would be implemented to evaluate the effectiveness of the remedy. This alternative is considered a Track 2 cleanup to allow for mixed residential and commercial use of the Site (Refer to Figure 9a).

3. <u>Full Removal of Impacted Fill Material, Soil and USTs, Groundwater Remediation; and Groundwater Monitoring:</u> Excavation and off-site disposal would be implemented to completely remediate soil contamination that exceeds NYSDEC

Track 1 SCOs and allows for unrestricted use of the Site. The on-site petroleum tank would also be removed along with petroleum impacted soils as possible. Contaminated groundwater that exceeds Track 1 SCOs in overburden and also bedrock that are not affected by the excavation dewatering would be addressed by in-situ remediation. Groundwater monitoring would be implemented to evaluate the effectiveness of the remedy. This alternative is considered a Track 1 cleanup to allow for unrestricted use of the Site (Refer to Figure 9b).

4.0 DETAILED EVALUATION OF ALTERNATIVES

The selected alternatives for addressing Site contamination are further evaluated in this section. These alternatives are evaluated relative to the criteria presented in Section 3.0, including the future mixed restricted residential and commercial use of the Site. Tables A and B provide evaluations of each alternative in relation to the remediation goals, and compares the opinion of costs to implement each alternative.

4.1 Individual Evaluation of Alternatives

Each of the alternatives identified in Section 3.7 are further evaluated in detail in this section of the report. Remedial Alternatives #2 and #3 will include the development and implementation of a Remedial Work Plan and a Health and Safety Plan (HASP).

Alternative #1 - No Action

Under Alternative #1, environmental conditions at the Site would essentially remain unaltered, and future Site use and development would not be limited via institutional controls or engineering controls. This alternative contains no substantive technical permit requirements. In addition, remedial and monitoring activities as well as placement of institutional controls at the Site are not implemented. Inclusion of this “No Action” alternative is a requirement of the NYSDEC BCP.

Alternative #1 Assessment

<u>Protection of Human Health and the Environment</u>

This alternative would not be protective of human health and the environment. Risks associated with potential human health exposure pathways would not be eliminated, reduced or controlled. RAOs for public health protection and environmental protection are not adequately addressed by this alternative.

<u>Compliance with SCG Values</u>

Alternative #1 does not provide adequate monitoring to evaluate compliance with chemical-specific SCG values. Location-specific SCG values are not met since the Site is located within an urban area and could adversely impact human health. Action-specific SCG values are not applicable under the No Action alternative.

Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence would not be adequately monitored. Potential exposure pathways identified as part of this project could occur under the No Action alternative.

Reduction of Toxicity, Mobility and Volume

It is likely that natural attenuation and other factors such as advection, dispersion, sorption, diffusion, etc. are occurring at this Site that would result in reduction of contaminant toxicity, mobility or volume over long periods of time (e.g., decades). This alternative would likely require a longer period of time than the more aggressive alternatives being evaluated.

Short-Term Impacts and Effectiveness

There would be no increased short-term impacts or risks associated with Alternative #1 since remedial activities are not implemented.

Implementability

Of the alternatives being considered, Alternative #1 is easiest to technically and administratively implement since remedial, institutional, monitoring, etc. activities are not required. In addition, there are no labor, material, permitting or accessibility requirements for this alternative.

Planned Future Use of the Site

The Site is currently developed urban land that the City envisions being redeveloped for Restricted Residential Use and/or Restricted Commercial Use. It is anticipated that this alternative would not be acceptable in relation to the planned future use of the Site.

Green Remediation

Alternative #1 does not employ sustainable techniques to attain Site cleanup goals in an effort to protect public health and the environment from impacted Site media.

Cost

There are no capital/initial costs or Operation, Maintenance, and Monitoring (OM&M)/Annual/Closeout costs associated with the No Action alternative. The costs for this alternative are summarized below and in Table B.

Capital/Initial Cost..$ 0
OM&M/Annual/Closeout Present Worth Cost..$ 0
Total Present Worth Cost ....$ 0

Alternative #2 – Impacted Area Removals; In-Situ Groundwater Remediation; Institutional Controls; Engineering Controls; and Groundwater Monitoring

Alternative #2 consists of various technical and administrative actions that are intended to remediate the highest concentrations of contamination at the Site, reduce exposure to Site contaminants, and provide long-term monitoring of groundwater to document the effectiveness of the remediation completed and to ensure that the contamination is not migrating. Approximate areas to be actively remediated under Alternative #2 are shown on Figure 9a. This alternative is considered a Track 4 cleanup for Restricted-Residential Use.

Alternative #2 includes a total of seven (7) distinct remedial components to address soil and groundwater impacts including:

1. In-situ treatment of impacted soil and groundwater
2. Impacted soil excavation, UST closure and off-site disposal
3. In-situ barrier installation
4. Installation of sub-slab depressurization system (SSDS)
5. Installation of soil cover
6. Institutional controls
7. Long-term monitoring

The primary focus of Alternative #2 will be the remediation of impacted soil and groundwater in Areas A and B as previously defined, in order to address Restricted Residential Criteria. However, remedial effort is also focused on areas where Protection of Groundwater Standards exceedances exist, particularly on the western boundary of the Site where the potential for off-Site migration is highest. Limited surface soil impacts also exist to the north of the building. Further details on the implementation of these measures are provided below.

Remediation of Impacts

Impacted area remediation work would be completed at the Site by means of the procedures listed above and described herein.

Goals of this alternative include:

- Remediating the VOC and petroleum contamination in soil to achieve Restricted-Residential Use SCOs and Protection of Groundwater SCOs;
- Remediating the residual VOC contamination in groundwater to achieve standards and guidance values as defined in NYSDEC TOGS 1.1.1 to the extent practicable;
- Controlling exposure to residual contaminants that may be present in historic fill material and soil at the Site; and
- Preventing off-Site migration in groundwater.

The locations of Alternative #2 remedial work are shown on Figure 9a, and are summarized below.

1. <u>In Situ Treatment of Impacted Soil and Groundwater</u>
   TCE-contaminated soil and groundwater are not readily accessible for removal from Area A or the surrounding area including Protection of Groundwater Exceedances in soil. The proposed approach for addressing impacts within Area A and the surrounding lesser impacted areas is anaerobic bioremediation using Regenesis, Incorporated Hydrogen Release Compound (HRC®). Using the mapped extent of soil exceeding 21 ppm of TCE as a guide and based on the anticipated contaminated zone thickness of six (6) feet (to a total depth of approximately nine (9) feet below grade), it is estimated that 82 cubic yards (140 tons) of TCE contaminated soil will need to be treated in-situ as described herein.

   Area A would be remediated using approximately eight (8) injection points installed on an approximate 15-foot grid spacing through the impacted zone. This "High Intensity" injection zone is differentiated from the surrounding "Low Intensity" injection zone on Figure 9a. The lower intensity injection zone extends westward through the building and beneath the parking lot following the outline of the approximate 3,670 square foot area of Protection of Groundwater exceedances. Wider grid spacing will be used for installation of approximately eight (8) additional injection points in the "Low Intensity" zone to address the lower TCE levels identified in soil and groundwater within this area. It is anticipated that the injection process would be completed during a single event, depending on the results of subsequent confirmatory sampling.

   As indicated in the RI, relatively low levels of TCE-impacted soils exist above the saturated zone within and surrounding Area A. Injection of the HRC® will be completed from a total depth of approximately 10 feet upward (as the tooling is withdrawn) to approximately four (4) feet below grade. This approach will facilitate contact with the majority of the subsurface impacts identified. The installation of the HRC® above the saturated zone (occurring at approximately six (6) to eight (8) feet below grade) will provide more thorough coverage of the impacted area by allowing downward percolation of HRC® to follow the likely pathway(s) of past TCE release. The fact that HRC® must be mixed with clean water for subsurface injection will also enhance microbial accessibility to TCE in the unsaturated zone. As discussed below, the planned installation of a SSDS will provide long term venting of sub-slab vapor, which will also allow for low-volume removal of residual TCE in the unsaturated zone over time.

   It is noted that HRC® works slowly, continuing to enhance microbial consumption of TCE and its daughter products for periods of up to two (2) years. Therefore, confirmatory sampling should be conducted after a minimum of one (1) year after initial injection has been completed. Up to 10 post-treatment soil samples and quality assurance/quality control (QA/QC) samples would be collected and analyzed for VOCs using United States Environmental Protection Agency (USEPA) Method 8260 to determine the effectiveness of the remedy. It is also anticipated that a total of 16 groundwater VOC samples would be obtained from existing wells around Area A over a two (2) year time frame.

Subsequent to the removal work, excavations would be backfilled with Site soils deemed re-usable and also with clean imported select geotechnical fill (e.g., crushed stone, bank run, etc.) that meets NYSDEC requirements set forth in DER-10.

Remaining existing wells would be maintained until such time that their decommissioning is formally requested, and only after the NYSDEC formally concurs that they can be decommissioned. In order to maintain these wells, many of their finished elevations would be adjusted to accommodate final Site grading (e.g., extend riser pipes, re-set or replace flush-mounted curb boxes).

The wells would be decommissioned in accordance with protocols outlined in the NYSDEC document titled "CP-43: Groundwater Monitoring Well Decommissioning Policy," dated November 3, 2009.

2. <u>Impacted Soil Excavation, UST Closure and Off-Site Disposal</u>
Initial efforts to address TCE and petroleum impacts associated with Area B will focus on the removal and proper closure of the abandoned UST located in this area. The existing UST, located near the southwest building corner, and surrounding contaminated soil would be removed and disposed off-site. This UST is east of GP-35 where total petroleum VOCs (including TICs) exceed 300 ppm. As this tank lies within Area B, soils excavated as part of that remedial effort will address some soils surrounding the tank. During the UST removal, soils will be continuously screened using a photoionization detector (PID); soils with readings in exceedance of 10 ppm as well as soils exhibiting solvent and/or petroleum odors will be temporarily staged on 6-mil polyethylene sheeting for waste characterization sampling and appropriate future disposal. Clean soil, exhibiting no odor and PID readings less than 10 ppm, will be staged separately for future backfill purposes. Ambient background air during the UST removal will also be continuously monitored with the PID.

Following tank removal, confirmatory soil samples from the excavation sidewalls and bottom will be collected in accordance to the NYSDEC Commissioner's Policy/51 (CP-51) *Soil Cleanup Guidance Document* criteria in October 2010 and NYSDEC *Technical Guidance for Site Investigation and Remediation* (DER-10), May, 2010. In addition, to determine the effectiveness of the tank and surrounding soil removal process relative to petroleum constituents, six (6) post-excavation field samples and QA/QC samples would be collected and analyzed for VOCs using USEPA Method 8260, and SVOCs using USEPA Method 8270. Analytical results will be compared to Restricted-Residential and Protection of Groundwater SCOs.

Concurrent with the removal of the UST and accessible petroleum-impacted soils adjacent to Area B, soils above the uppermost groundwater table and vadose zone, including beneath the former UST location, would be removed, staged and disposed off-Site. Some soils in Area B would remain as they are under the existing building and are not accessible. Saturated soils would also remain in-place. Using the mapped extent of soil exceeding 21 ppm of TCE as a guide (see Figure 9a), it is estimated that 35 cubic yards (55 tons) of TCE contaminated soil would be removed. Depending on accessibility and screening results, additional soil could be removed during this process.

Based on the mapping and analytical results, it is estimated that the top four (4) to six (6) feet of soil in this area is re-usable and would be excavated and staged on-site in order to remove the extent of TCE-impacted soil projected for off-site disposal. Clean soil (as identified by screening with a PID) would later be re-used to partially backfill the excavation. It is assumed that dewatering would not be required to advance the excavation to the required depth. At least two (2) wells will be installed into the former excavation as backfilling takes place. These wells will be used to monitor the effectiveness of Alternative #2 relative to groundwater.

Relative to TCE impacts in this area, it is estimated that six additional (6) post-excavation soil and eight (8) groundwater samples and quality assurance/quality control (QA/QC) samples would be collected and analyzed for VOCs using United States Environmental Protection Agency (USEPA) Method 8260 to determine the effectiveness of the remedy. It is assumed that groundwater sampling would be conducted over a two (2) year time frame.

Saturated zone soils and groundwater will be remediated in-situ using “High Intensity” installation (and/or injection) of HRC® in the rectangular area located at Area B on Figure 9a. “Low Intensity” HRC® installation will occur in the surrounding area after excavation has been completed. “High Intensity” HRC® installation will be completed prior to the backfilling process by directly releasing the material into the open excavation and mixing using excavation equipment.

While anaerobic bioremediation is a well-proven method for reductive dechlorination of TCE, microbial degradation of petroleum impacts is most efficient in an oxidizing environment. It is noted however, that the presence of petroleum in the subsurface environment can serve as a “hydrogen donor” for chlorinated solvent remediation. Despite the fact that the installation of HRC® will not likely have a substantial direct benefit for the remediation of petroleum residues in this location, the enhanced microbial activity will increase the demand for hydrogen ions and will likely reduce the concentration of residual petroleum constituents over time.

3. <u>In-Situ Barrier Installation</u>
In order to directly address to potential for westward migration of TCE a barrier will be installed consisting of Regenesis Inc. Plume Stop® (liquefied activated carbon), which will be injected into the saturated zone to the immediate east of the MW-201 well cluster. This material would require installation along an approximate 50-foot line oriented north/south (see Figure 9a) to intersect westward-flowing groundwater and reduce down-gradient concentrations of TCE. The Plume Stop® product consists of colloidal activated carbon in a proprietary matrix, which is designed to easily disperse in the saturated zone and facilitate the bioremediation process by providing a favorable environment for the formation of microbial colonies. It is anticipated that this material could be installed using five (5) injection points, directly injecting the material into the saturated zone between approximately 10 and six (6) feet below grade in a single injection event.

   Monitoring and sampling of the MW-201 well cluster would be necessary to verify the effectiveness of the Plume Stop® installation over time. It is estimated that 12 groundwater samples and quality assurance/quality control (QA/QC) samples would be collected and analyzed over the course of two (2) years for VOCs using United States Environmental Protection Agency (USEPA) Method 8260 to determine the effectiveness of this portion of the.

4. <u>Installation of SSDS</u>
During redevelopment of the property, it is understood that a SSDS must be installed to mitigate potential impacts to building occupants from TCE soil vapor. The layout of this system has not been established, but it will be designed and certified by a licensed environmental engineer prior to installation. In addition to mitigating potential TCE vapor exposure to building occupants, the SSDS will ventilate the sub-slab environment and will provide the long-term benefit of contaminant reduction in the unsaturated zone beneath the building.

5. <u>Installation of Soil Cover</u>
It is understood that the final layout of the redevelopment work at the subject Site has not been finalized. However, it is anticipated that installation of up to two (2) feet of clean cover material will be necessary in the area of SS-03, where elevated concentrations of sVOCs were identified exceeding Restricted Residential Criteria. The potential installation of this cover material is indicated

on Figure 9a, and is estimated to require a total of 122 cubic yards of clean fill material covering an area of approximately 1,650 square feet.

Elsewhere on the Site, Restricted Residential exceedances of barium and chromium exist in isolated areas. However, the presence of the parking lot and the building itself prevents direct contact with these contaminants at depth. Therefore, no mitigation or removal of these exceedances is proposed.

6. <u>Institutional Controls</u>
As part of Alternative #2, it is anticipated that institutional controls would be established in the form of an environmental easement accompanied by a survey map meeting NYSDEC requirements that would:
    - Limit the use and development of the property to Restricted-Residential, which would also permit commercial and industrial use;
    - Restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH;
    - Require evaluation of the potential of vapor intrusion into the existing building (prior to occupancy) and any new structures, and installing and operating a vapor mitigation system if deemed necessary; and
    - Require the property owner to complete and submit to the NYSDEC a periodic certification of the institutional controls.

The periodic certification of institutional controls would be prepared and submitted by a professional engineer or such other expert acceptable to the NYSDEC, until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would: contain certification that the institutional controls put in place are still implemented and are either unchanged from the previous certification or are compliant with NYSDEC-approved modifications; allow the NYSDEC access to the site; and state that nothing has occurred that would impair the ability of the control to protect public health or the environment.

Institutional Controls would also include development and implementation of a Site Management Plan (SMP) to require evaluating the potential for vapor intrusion into any future buildings on the Site, including requirements to mitigate such potential vapor intrusions through use of environmental engineering controls [e.g., sub-slab depressurization system (SSDS) other means associated with redevelopment of the buildings in a manner that preclude SVI exposure. The SMP would identify use restrictions for the Site (e.g., property development and groundwater use restrictions, etc.), would include a Health and Safety Plan (HASP) to assist in reducing potential exposures to Site contaminants, and would include an Operations, Maintenance, and Monitoring Plan (OM&M) associated with groundwater monitoring and engineering controls (as required).

The SMP would also include an Excavation Work Plan to manage the handling, characterization, disposal and re-use of potentially impacted Site media.

7. Long-Term Monitoring

Subsequent to the impacted soil removals and in-situ groundwater remediation, a groundwater monitoring program would be implemented to evaluate the effectiveness of the remedy. For each monitoring event, static water level measurements would be collected from monitoring wells and one (1) or more potentiometric groundwater contour maps would be prepared. This alternative presumes that groundwater monitoring would be performed on a quarterly basis for a period of two (2) years, and on an annual basis thereafter, as determined by the NYSDEC. However, the actual groundwater monitoring plan would be identified in a subsequent document, and would be dependent upon post-remedial conditions and the specific in-situ groundwater remediation technology that is implemented (e.g. more aggressive remediation will likely require shorter duration of monitoring).

During each monitoring event, it is anticipated that groundwater samples would be collected from at least four (4) monitoring wells. Samples would be monitored for water quality parameters (e.g., dissolved oxygen, oxidation-reduction potential, conductivity, temperature, turbidity and pH) and also undergo analytical laboratory testing for TCL VOCs using USEPA Method 8260 and other parameters as necessary to monitor the effectiveness of the remedy based on the remedial technology selected.

With approval from regulatory agencies, the duration and frequency of the groundwater monitoring, as well as the parameters to be tested, may be adjusted based on the test results of samples collected during the first year of the monitoring program.

Alternative #2 Assessment

Protection of Human Health and the Environment

It is anticipated that Alternative #2 would be protective of mixed residential and commercial use of the Site. Risks associated with potential human health exposure pathways would be eliminated or adequately controlled/mitigated including down-gradient migration of impacted groundwater towards off-Site property to the west. With the exception of restoring the groundwater aquifer to pre-disposal/pre-release conditions, RAOs for soil and groundwater would be adequately addressed by this alternative in relation to protection of on-site public health and the environment. The tasks associated with addressing the RAOs could readily be completed.

Compliance with SCG Values

Alternative #2 would meet SCG values for Restricted Residential Use and Protection of Groundwater for soil contaminated with VOCs. Some soil or fill material containing constituents (e.g. SVOCs, metals) at concentrations exceeding Restricted-Residential Use SCOs or Protection of Groundwater Use SCOs would remain on-site, but would be managed in accordance with institutional controls (ICs) and engineering controls (ECs). Alternative #2 provides adequate monitoring to evaluate compliance trends in relation to chemical-specific SCG values for soil and groundwater. This alternative would meet location-specific SCG values for protection of on-site and off-Site human health and the environment in part, by mitigating the down-gradient migration of TCE-impacted groundwater. Action-specific SCG values would also be adequately addressed with this alternative.

Long-Term Effectiveness and Permanence

The long-term risk associated with the contamination would be effectively reduced by: 1) the impacted soil removals; 2) in-situ remediation of overburden groundwater; and 2) the ICs and ECs for the Site. It is anticipated that the components of this alternative would prove to be reliable, and would have the ability to continue to meet RAOs in the future. The remedial components of this alternative are effective in the long term and permanently remove or destroy the VOCs in the soil and groundwater at the Site that require remediation, and control other contaminants present at the Site. The long-term effectiveness and permanence of this alternative in relation to residual contaminants would be monitored.

Reduction of Toxicity, Mobility and Volume

The impacted soil removals, in-situ groundwater remediation, natural attenuation, by factors such as microbial degradation, advection, dispersion, sorption, and diffusion would result in reduction of contaminant toxicity, mobility and volume.

Short-Term Impacts and Effectiveness

This alternative would likely result in a slight risk in regard to short-term impacts. It is anticipated that Site workers and the community would have increased risk at exposure to site contamination (i.e., nuisance odors, inhalation and contact with site contaminants, etc.). However, implementation of a HASP and Community Air Monitoring Plan (CAMP) that include dust, odor, and fume control contingencies, and also a SMP, would protect site workers and the nearby community from these short-term risks. It is anticipated that active on-Site remediation activities could take a total of one (1) month to implement. The removals would result in significant reduction of potential impacts to workers during subsequent redevelopment activities. Physical hazard risks would also likely increase during excavation and backfill activities (e.g., excavation wall stability issues, dewatering issues, etc.).

Implementability

This alternative can be implemented easily in relation to the anticipated future use of the Site for mixed residential and commercial use. Spatial requirements can be accommodated on this Site and would not impede completion of this alternative.

Planned Future Use of the Site

The Site is currently urban land that the City envisions being redeveloped for mixed residential and commercial use. This alternative would be acceptable in relation to the planned future use of the Site.

Green Remediation

This alternative would incorporate sustainable remedial technologies including enhanced biological degradation to address residual TCE-impacted groundwater. Pursuant to DER-31, bioremediation products, such as HRC®, are employed to protect public health and the environment and attain Site cleanup goals in a cost-effective manner.

Cost

Alternative #2 costs are less than Alternative #3 costs. The costs for this alternative are summarized below relative to a three (3) year closeout period and detailed in Table C.

Capital/Initial Cost	$ 205,000
OM&M/Annual/Closeout Present Worth Cost	$ 7,500
Total Present Worth Cost	**$ 225,500**

Alternative #3 - Full Removal of Impacted Fill Material, Soil and USTs; Groundwater Remediation; and Groundwater Monitoring

Soil/Fill Removal

In order to develop the scope of this remedial alternative, the analytical results for soil and historic fill samples will be compared to NYSDEC Track 1 SCOs for Unrestricted Use. The volume soil/fill to be excavated, transported off-site, disposed of at a regulated landfill, and replaced with imported fill meeting NYSDEC requirements outlined in DER-10 is estimated to total approximately 680 cubic yards (1,125 tons). [Note: The removal includes the impacted removal areas identified in Alternative # 2 (refer to Figure 9a), as well as historic fill and other soil exceeding Unrestricted Use SCOs as shown in Figure 9b]. This alternative would require removing portions of the concrete slab within the existing building in order to access underlying soils. Areas of select clean geotechnical fill (e.g., crushed stone) meeting DER-10 requirements would remain on Site and not be temporarily excavated if underlain by indigenous soil that meets Unrestricted Use SCOs. This Alternative represents a Track 1 cleanup approach.

Well Decommissioning

As part of this alternative, all existing on-Site groundwater monitoring wells would be decommissioned in accordance with protocols outlined in the NYSDEC document titled "CP-43: Groundwater Monitoring Well Decommissioning Policy" dated November 3, 2009. The wells would be decommissioned prior to or during the removal of soil/fill described above.

Groundwater Dewatering and Treatment

During the soil/fill removal work, it is assumed that infiltrating water would be pumped into a minimum of four (4) frac tanks and that the water would be discharged to a publicly owned treatment works (POTW) under a sewer use permit at varying intervals of the project. The water would be pre-treated if deemed necessary as the removal work progressed.

Post-Excavation Soil Sampling, Backfilling, and Restoration

Post-excavation confirmatory soil samples would be collected and analyzed for appropriate parameters. Guidance in NYSDEC DER-10 and input from the NYSDEC Project Manager would be used to determine location and number of post-excavation samples to be collected and analyzed from each removal area. Considering the removal area is approximately 3,769 square feet in size, it is anticipated that up to 10 discrete soil samples (i.e., approximately one (1) sample per 600 square feet of area) and QA/QC samples would be collected from the bottom of the removal areas. In addition, it is anticipated that up to 10 discrete soil samples (i.e., approximately one (1) sample per 600 square feet of area), and QA/QC samples would be collected from the sidewalls of the removal areas. These samples and the QA/QC samples would be tested for TCL VOCs, TCL SVOCs, and TAL Metals using USEPA Methods 8260, 8270, 6010 and 7471.

If confirmatory soil sample results exceed applicable SCG values (i.e., Unrestricted Use SCOs), then further removal and off-site disposal would be performed to the extent deemed necessary by the NYSDEC and additional confirmatory soil samples would be collected and analyzed. Once confirmatory soil sample test results indicate that no further soil needs to be removed, imported soil (e.g., topsoil, bank run, crusher run, etc.) that does not contain constituents at concentrations above Unrestricted Use SCOs (i.e., Track 1 cleanup), and also meets other criteria outlined in DER-10, would be used to backfill the excavation areas and be re-seeded/improved to the extent deemed appropriate for the redevelopment plans for the Site.

In-Situ Groundwater Remediation

To supplement the excavation dewatering groundwater remediation discussed above, in-situ groundwater remediation at the Site would be conducted to target residual site contaminants (e.g., TCE) in groundwater, sorbed to aquifer materials, or DNAPL (if present) within the overburden and bedrock that have the potential to cause exceedances of groundwater SCGs (i.e., TOGS 1.1.1 groundwater standards and guidance values). If necessary, other types of constituents (e.g., metals) would also be remediated to the extent required by the NYSDEC. Figure 9b depicts the approximate area currently targeted for in-situ groundwater treatment. It is anticipated that the in-situ remediation would be facilitated by installation of Regenesis HRC or equivalent material, which would be intended to enhance reductive dechlorination of the remaining TCE in the subsurface. It is presumed that in-situ remediation could include injection through a delivery system that is installed in the TCE-impacted area excavations, as deemed necessary. It is anticipated that the in-situ groundwater remediation would be completed within a one (1) to three (3) year timeframe. Bench-scale treatability tests, baseline monitoring, process monitoring and performance monitoring would likely be completed as part of this remedial component.

Groundwater Monitoring

As part of Alternative #3, a groundwater monitoring program would be implemented. For each monitoring event, static water level measurements would be collected from the on-site monitoring wells, and potentiometric groundwater contour map(s) would be prepared. Groundwater monitoring would be performed on a bi-annual basis for a period of up to two (2) years. During each monitoring event, samples would be collected from the groundwater monitoring wells, the samples would be monitored for water quality parameters (e.g., dissolved oxygen, oxidation-reduction potential, conductivity, temperature, turbidity and pH), and analytical laboratory samples would be tested for TCL VOCs and possibly also TAL Metals using USEPA Methods 8260, 6010 and 7470, and other parameters as necessary to monitor the effectiveness of the remedy based on the remedial technology selected.

With approval from regulatory agencies, the duration and frequency of the groundwater monitoring, as well as the parameters to be tested, may be adjusted based on the test results of samples collected during the first year of the monitoring program.

Alternative #3 Assessment

Protection of Human Health and the Environment

It is anticipated that Alternative #3 would be protective of human health and the environment. Risks associated with potential human health exposure pathways would be eliminated or adequately controlled. RAOs for soil and groundwater are adequately addressed by this alternative in relation to protection of public health and the environment. The tasks associated with addressing the RAOs would be difficult to complete (i.e. removal of concrete slabs would have detrimental impacts on structural stability of the building).

Compliance with SCG Values

Alternative #3 is anticipated to meet chemical-specific SCG values and location-specific SCG values. Action-specific SCG values can be adequately addressed for this alternative.

Long-Term Effectiveness and Permanence

This alternative would be effective long- term and result in a permanent remedy. The long-term risk associated with the contamination would be eliminated. It is anticipated that this alternative would prove to be reliable and would meet RAOs in the future.

Reduction of Toxicity, Mobility and Volume

Under Alternative #3, the toxicity, mobility and volume of the contamination is reduced for the Site. The effects of removing this contamination from the Site and the effects of remediating residual contamination would be irreversible.

Short-Term Impacts and Effectiveness

This alternative would likely result in the greatest increased risk to short-term impacts to human health and the environment. Site workers and the community would have greater risk at exposure to site contamination (i.e., nuisance odors, inhalation and contact with site contaminants, etc.). However, implementation of a HASP and CAMP that include dust, odor, and fume control contingencies would protect site workers and the nearby community from these short-term risks. This alternative includes the most disruption to the Site and would take the longest time on-Site to implement. The removal of the contamination would result in significant reduction of potential impacts to workers during subsequent development operations. Physical hazard risks would also likely increase during excavation and backfill activities (e.g., excavation wall stability issues, dewatering issues, etc.).

Implementability

Alternative #3 would be difficult to implement. Removal of the concrete slab to access underlying soils would compromise the structural integrity of the existing building. Adjacent public sidewalks or right-of-ways would need to be closed for a period of time until excavations along the property boundaries were backfilled.

Planned Future Use of the Site

The Site is currently urban land that the City envisions being redeveloped for mixed residential and commercial use. This alternative would be acceptable in relation to the planned future use of the Site.

Green Remediation

In accordance to DER-31, this alternative would incorporate sustainable remedial technologies including enhanced biological degradation to address residual TCE-impacted groundwater. However, full removal of impacted soil and fill material would result in more fuel use and waste generation.

Cost

Costs for implementing Alternative #3 would be excessive in relation to the benefits gained. The costs for this alternative are summarized below based on a three (3) year monitoring period.

Capital/Initial Cost	$ 515,000
OM&M/Annual Closeout Present Worth Cost	$ 7,500
Total Present Worth Cost	**$ 535,500**

4.2 Individual Evaluation of Alternatives

This section of the report compares the remedial alternatives proposed for this Site. For reference, the alternatives are reiterated as follows:

Alternative #1	No Action
Alternative #2	Soil and UST Removals; In-Situ Groundwater Remediation; Institutional Controls; Engineering Controls; and Groundwater Monitoring
Alternative #3	Full Removal of Impacted Fill Material, Soil and USTs; Groundwater Remediation; and Groundwater Monitoring

A breakdown of estimated costs for each alternative is found in Tables A and B included in Appendices A and B. The costs provided are for comparative and estimating purposes only; actual costs will likely vary.

The proposed remedy is based on the results of the 2016 Remedial Investigation and the evaluation of alternatives presented herein. A detailed evaluation of the three (3) remedial alternatives was performed, and implementation of Alternative #2 (Impacted Area Removals; In-Situ Groundwater Remediation; Institutional Controls; Engineering Controls; and Groundwater Monitoring) is recommended for the Site. Alternative #2 would achieve the remediation goals for the Site by: removing contaminated soil/fill; removing the existing petroleum UST; treating contaminated groundwater; controlling exposure to residual contamination through the use of institutional controls and engineering controls; creating conditions that restore groundwater quality to the extent practicable; and monitoring of groundwater to evaluate the effectiveness of the remedy.

<u>Comparative Analysis of Alternatives</u>

- Alternative #2 satisfies the threshold criteria (protection of human health and the environment; and compliance SCG values) and provides the best balance of the primary balancing criteria described that are identified in Section 3.5. Alternative #1 does not satisfy the threshold criteria and is not considered viable alternative; thus is not further discussed in this comparison. Alternative #3 satisfies the threshold criteria, but does not provide the best balance of the primary balancing criteria.
- The long term effectiveness and permanence of Alternative #2 is adequate as a Track 4 cleanup with use restrictions. The adequacy and reliability of engineering controls and institutional controls will have the ability to continue to meet RAOs and keep residual contamination from posing significant threats, exposure pathways, or risks to the community or environment. The long term effectiveness and permanence of Alternative #3 is adequate as a Track 1 cleanup for unrestricted use and does not require engineering controls or institutional controls since residual contamination would not be left at the Site.
- Alternative #3 would have a greater reduction in toxicity, mobility and volume of contamination at the Site than Alternative #2; however, Alternative #2 would still result in a significant reduction of toxicity, mobility and volume of contamination at the Site.
- Alternative #3 would likely result in a faster cleanup than Alternative #2; however, Alternative #3 would likely have a higher potential for short-term adverse impacts and risk to the community and workers during implementation of the remedy. For either alternative, implementation of a HASP and CAMP would protect site workers and the nearby community from these short-term risks.
- Alternative #2 can easily be implemented at the Site. Alternative #3 would be difficult to implement, especially given the amount of soil/fill that would require removal and the need to remove parts of the existing building slab to facilitate soils removal.
- Alternative #2 and #3 would be acceptable for the planned future use of the Site.
- Alternative #2 costs are anticipated to be more than two (2) times lower than Alternative #3 costs. Alternative #3 costs are excessive in relation to benefits gained over Alternative #2.

In summary, Alternative #2 is a cost-effective alternative that is being recommended for implementation at the Site.

It is anticipated that the NYSDEC would allow upper level redevelopment to commence prior to implementation of a remedy. However, any intrusive redevelopment work planned within the portions of the property requiring remediation would need to occur once the following components of Alternative #2 are completed/approved by the NYSDEC:

- Impacted soil removals;
- Groundwater remediation;
- Continued groundwater monitoring;
- Preparation of a SMP;
- Preparation and recording of the environmental easement, including the required survey map and other supporting documentation as deemed necessary;
- Evaluation of the potential of soil vapor intrusion into renovated structures and implementation of a soil vapor mitigation system if deemed required; and
- Preparation of a Final Engineering Report (FER).

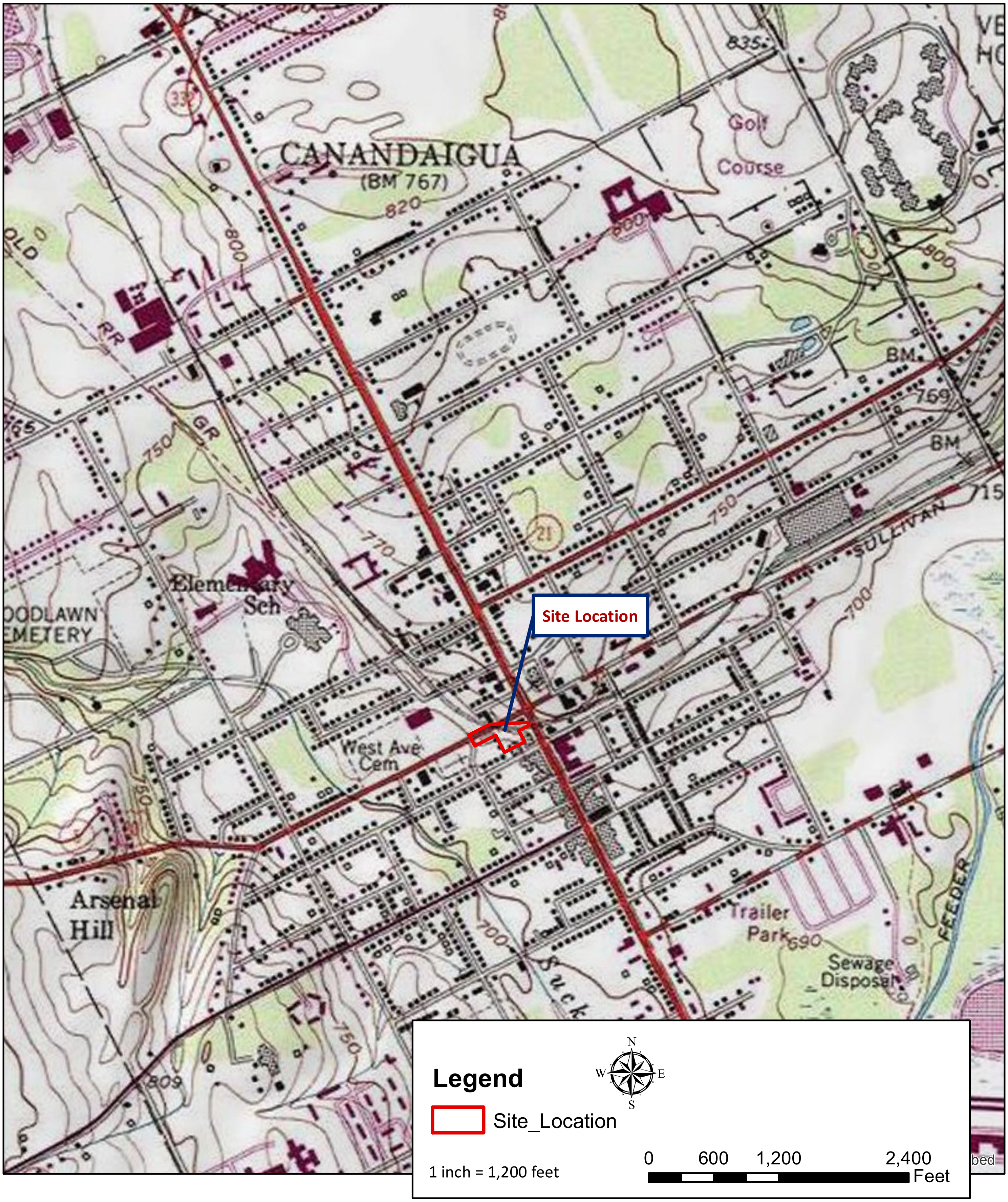


Figure 1a. Site Location

FORMER LABELON BCP SITE

Alternative Analysis Report

10 Chapin Street, Canandaigua, NY

MacDONALD ENGINEERING

DATE: DECEMBER 2014

PROJECT NO: 50279-02

DRAWN/CHECKED: CSB/GLA

DATA SOURCE:
USGS, ESRI ONLINE

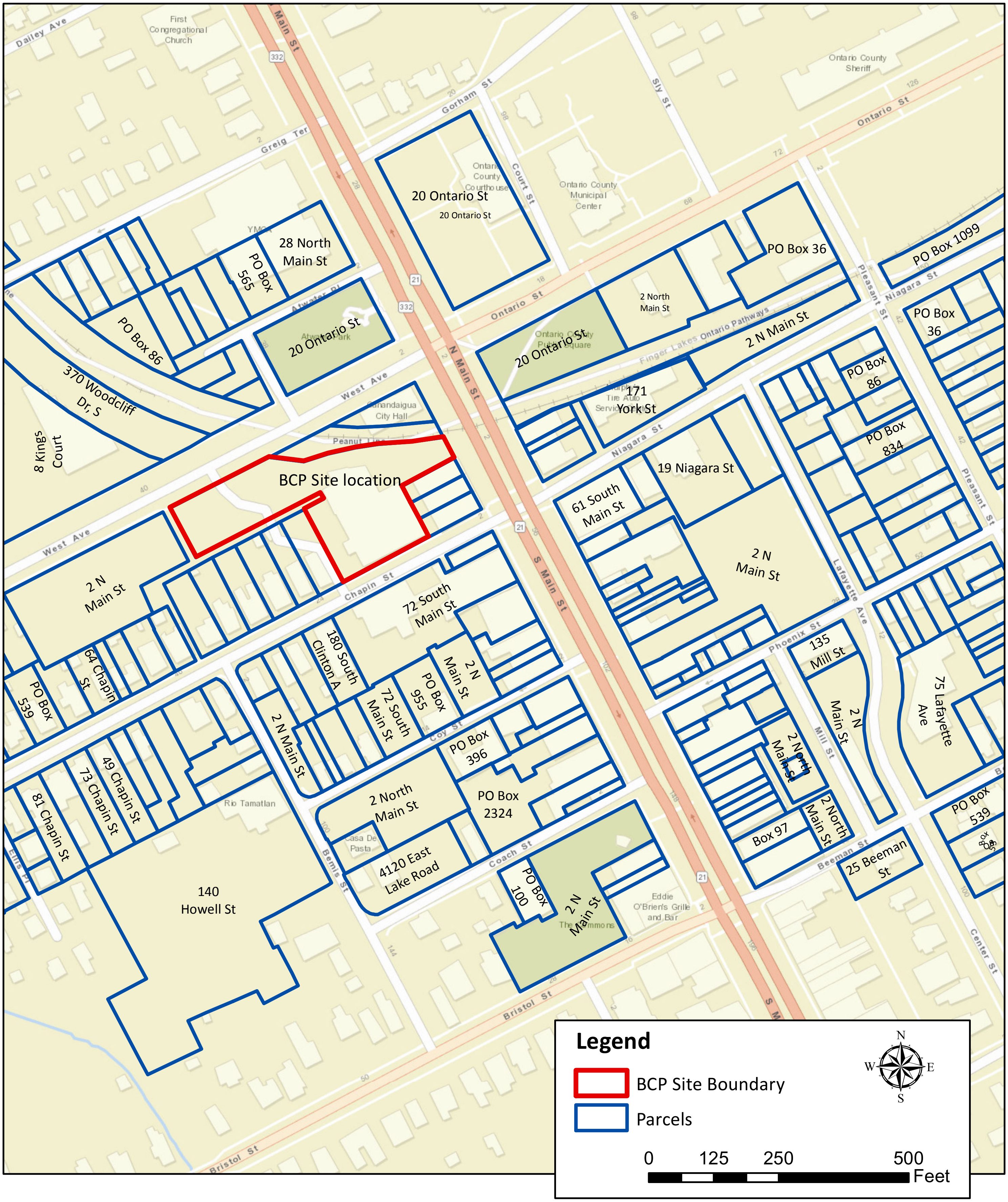


Figure 1b. Former Labelon BCP Site Boundary

Alternative Analysis Report

10 Chapin Street, Canandaigua, NY

MacDonald Engineering

DATE: APRIL 2017
PROJECT NO: 50279-02
DRAWN/CHECKED: CSB/GLA
DATA SOURCE: USGS, ESRI ONLINE

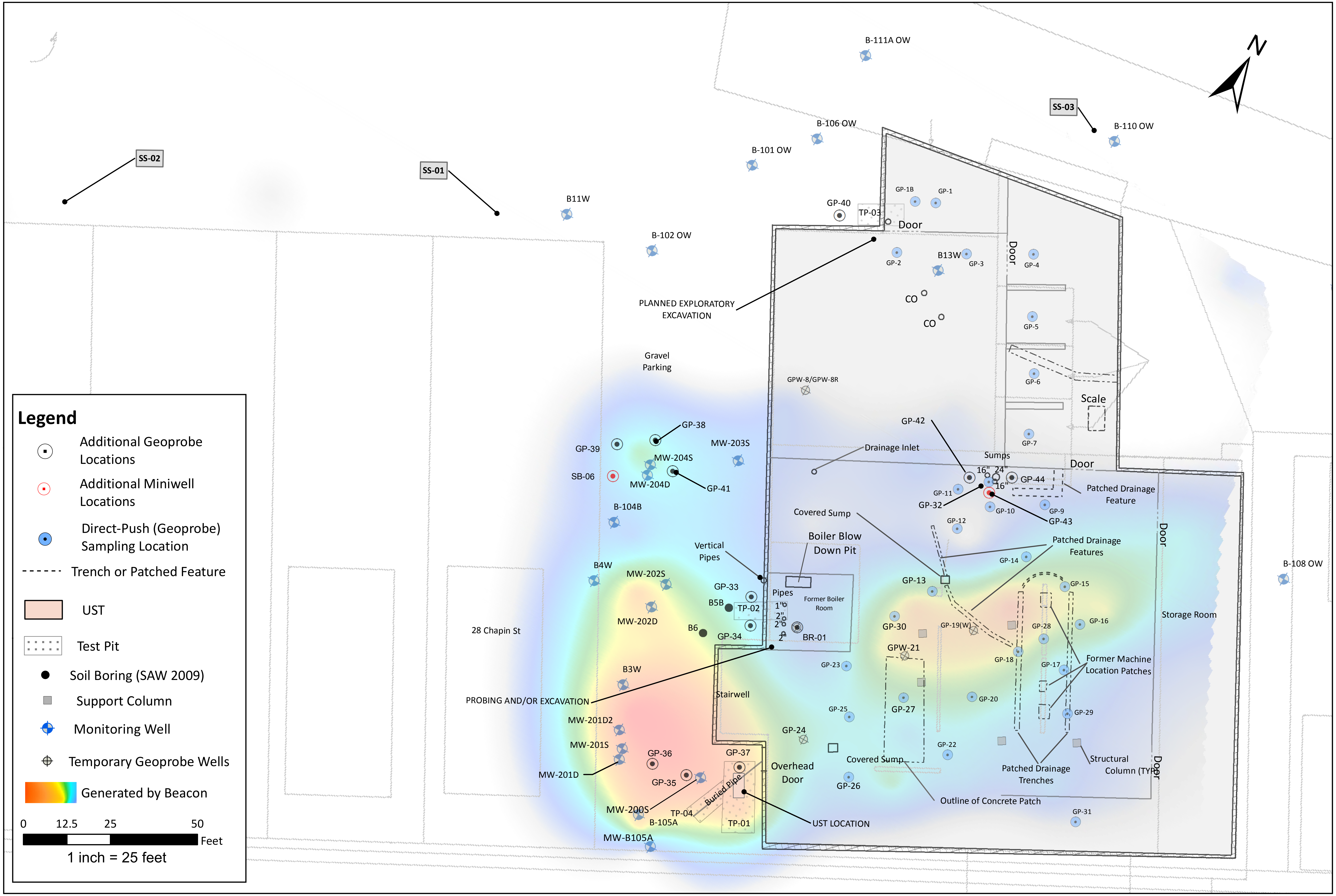


Figure 2. Site Plan

Alternative Analysis - FORMER LABELON BCP SITE

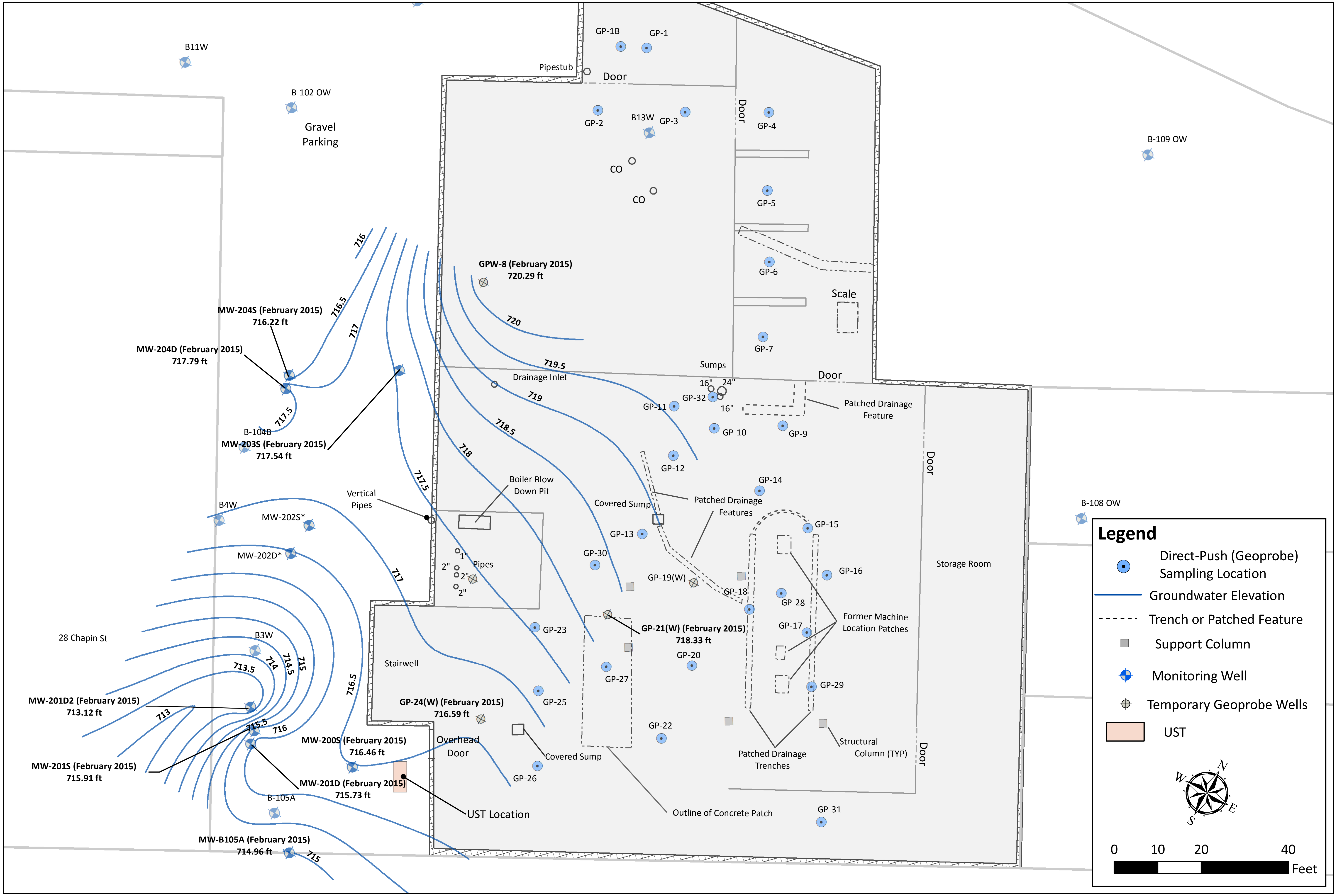
DATE: April 2017

DRAWN/CHECKED: CSB/GLA

1 Inch= 25 Feet

DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering

MacDonald Engineering



DATE: OCTOBER 2015

DRAWN/CHECKED: CSB/GLA

1 Inch= 20 Feet

DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering

Figure 3a. Groundwater Contour Map 2015

Alternative Analysis Report - FORMER LABELON BCP SITE.

MACDONALD ENGINEERING

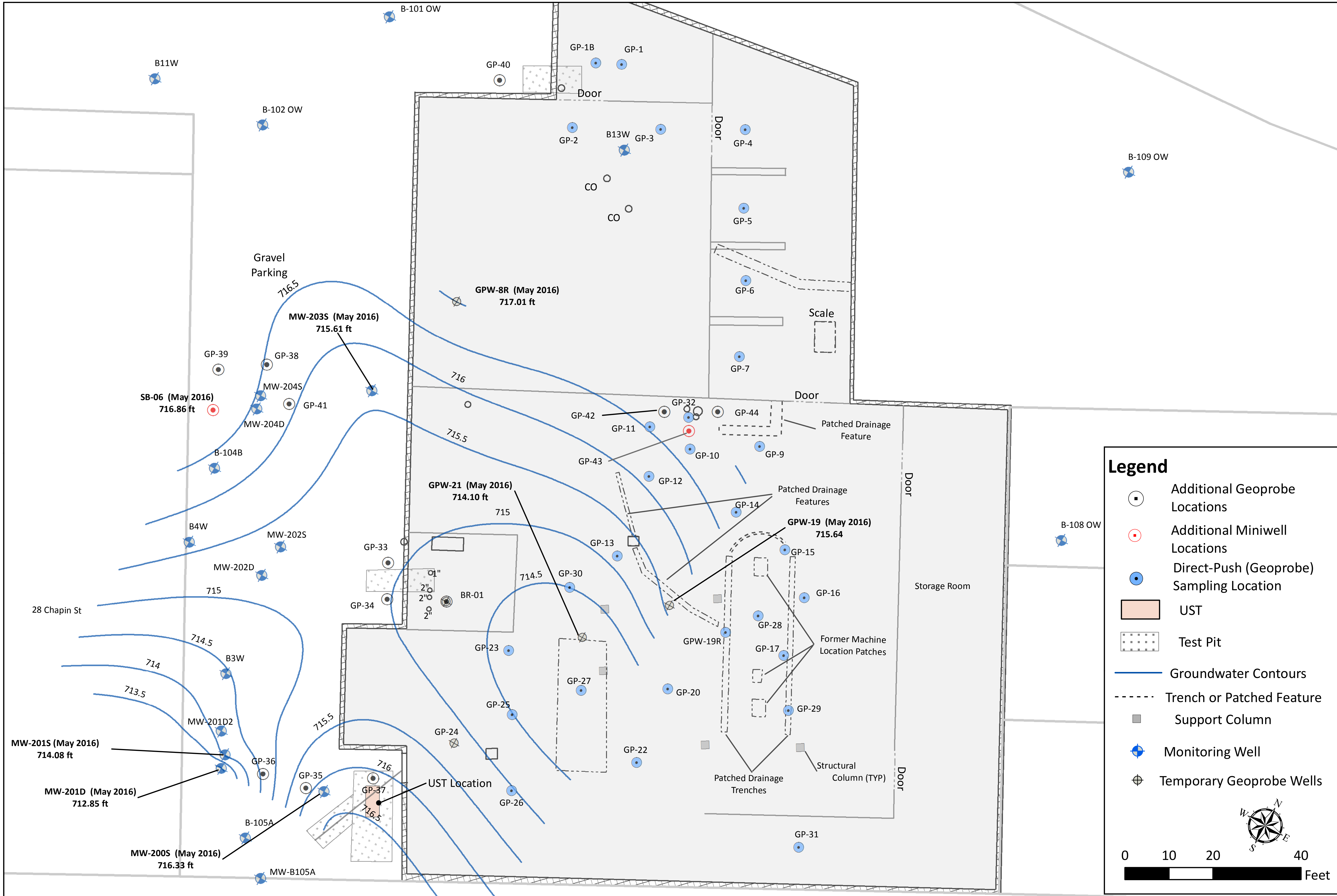


Figure 3b. Groundwater Contour Map 2016

Alternative Analysis Report - FORMER LABELON BCP SITE

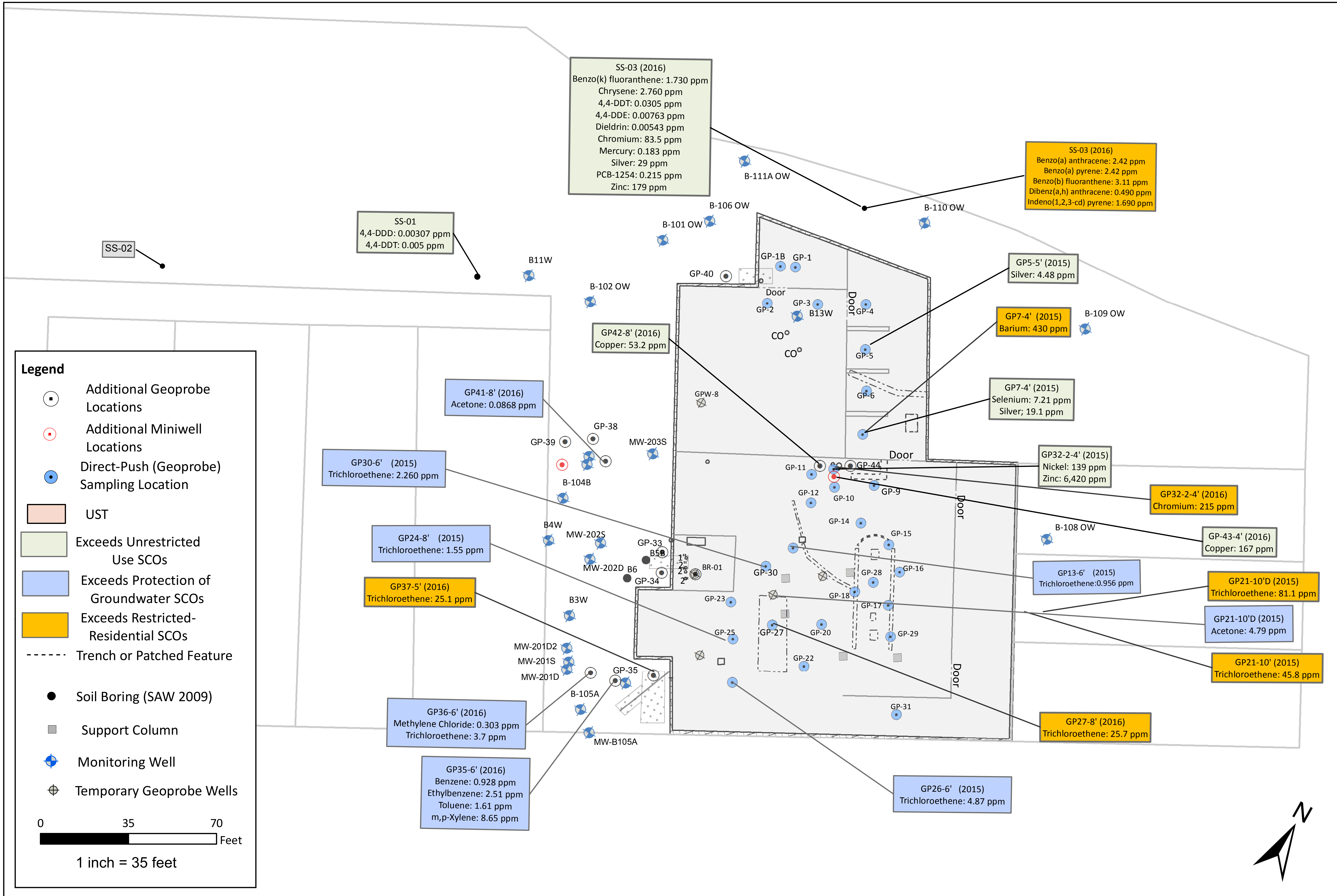
DATE: OCTOBER 2016

DRAWN/CHECKED: CSB/GLA

1 Inch= 20 Feet

DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering

MacDonald Engineering



DATE: APRIL 2017

DRAWN/CHECKED: CSB/GLA

1 Inch= 35 Feet

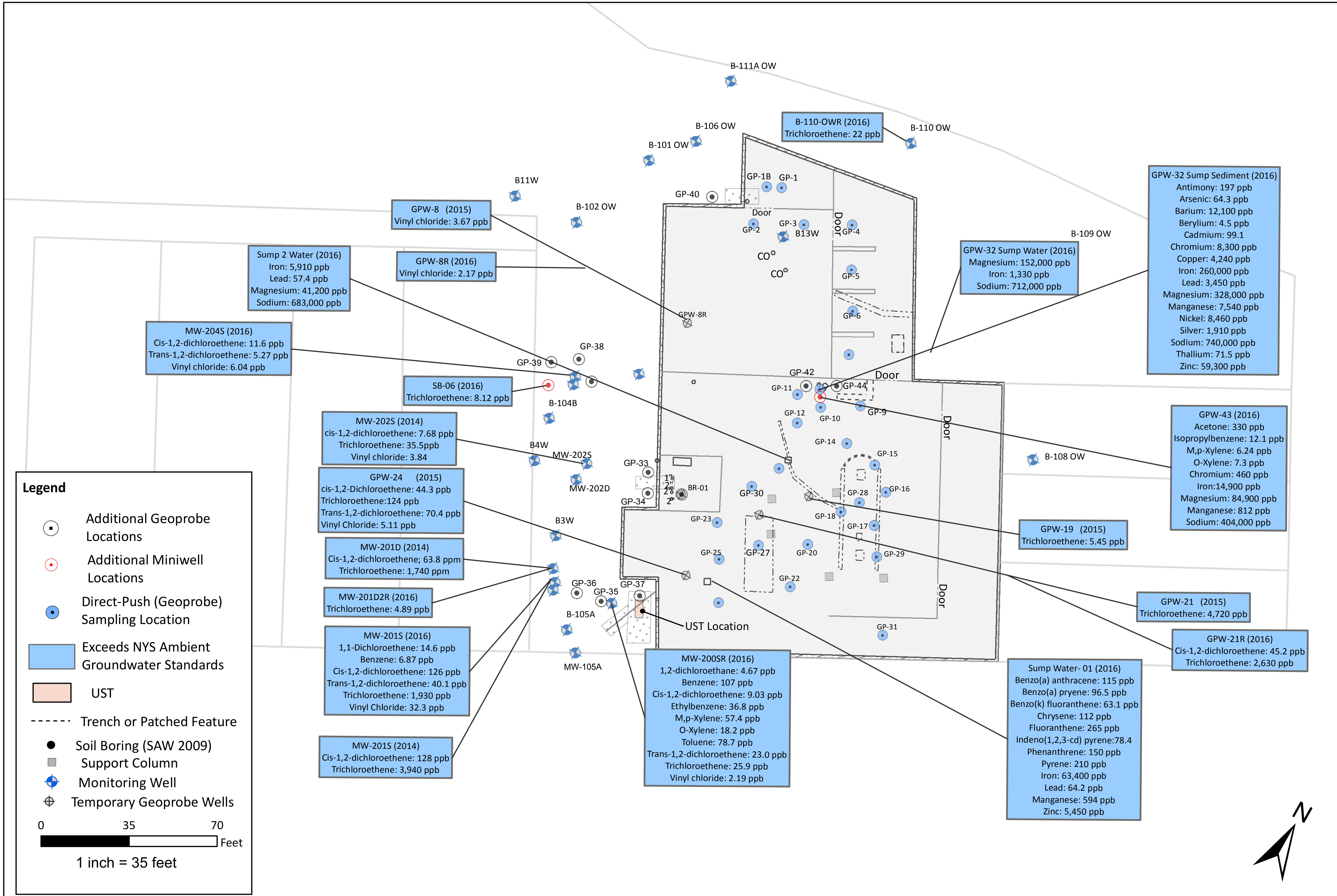
DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering

Figure 4a. Soil Analytical Results Plan- Exceedances

Alternative Analysis Report

FORMER LABELON BCP SITE

MacDonald Engineering



DATE: APRIL 2017

DRAWN/CHECKED: CSB/GLA

1 Inch= 35 Feet

DATA SOURCE:
NYS ORTHOIMAGERY,
MacDonald Engineering

Figure 4b. Groundwater Analytical Results Plan- Exceedances

Alternatives Analysis Report
FORMER LABELON BCP SITE

MacDONALD ENGINEERING

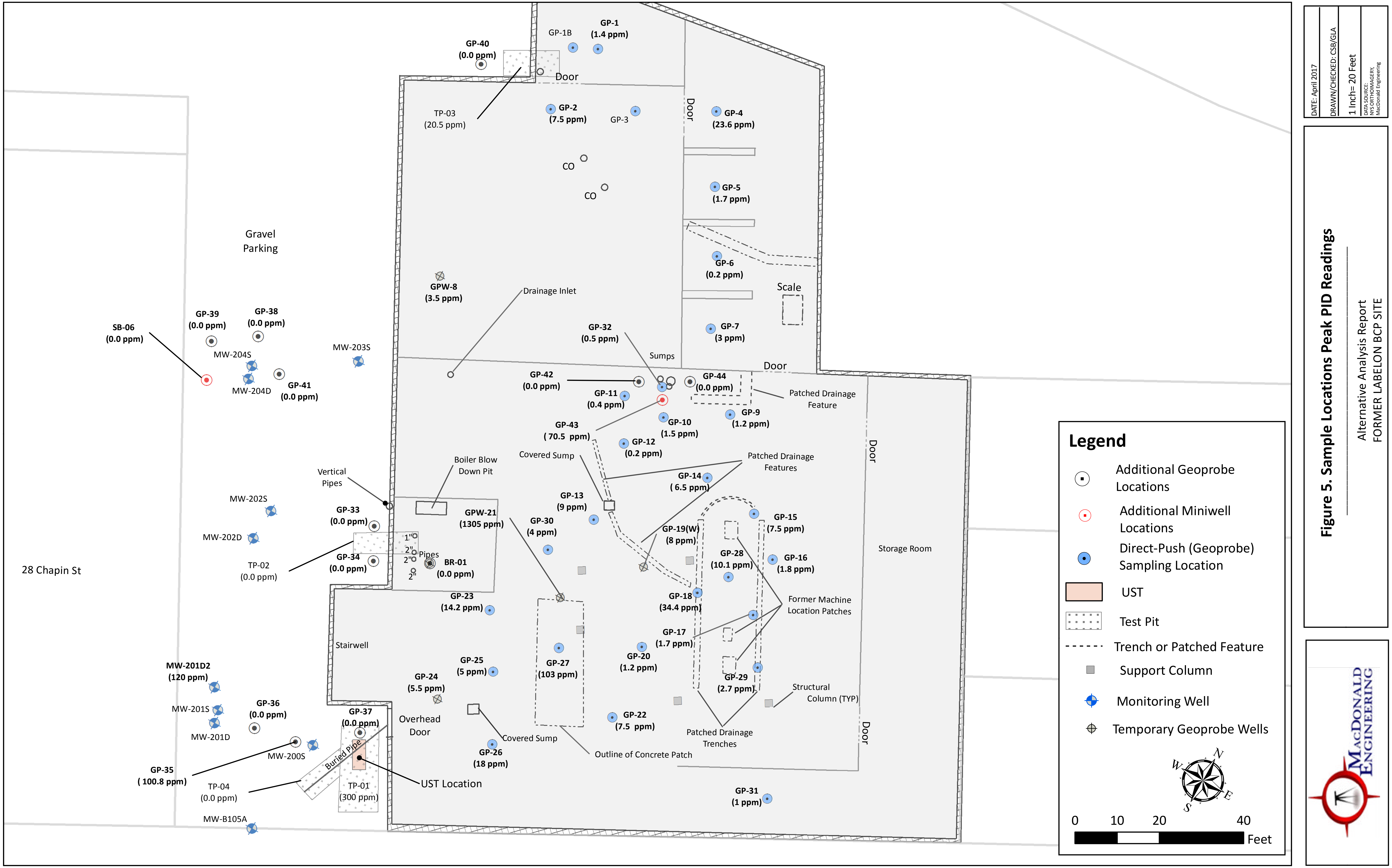
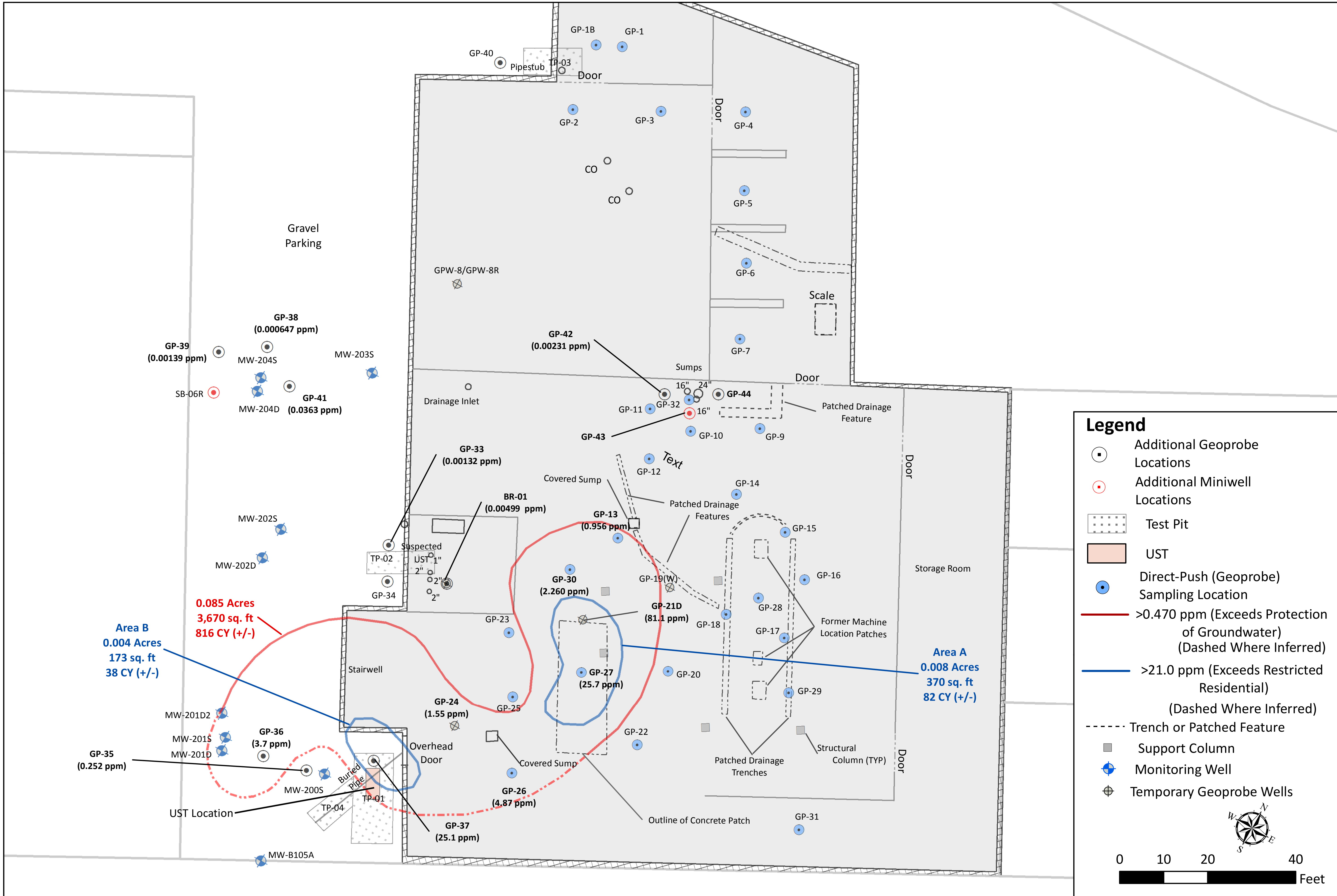


Figure 5. Sample Locations Peak PID Readings
Alternative Analysis Report
FORMER LABELON BCP SITE
DATE: April 2017
DRAWN/CHECKED: CSB/GLA
1 Inch= 20 Feet
DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering
MACDONALD ENGINEERING
Legend
Additional Geoprobe Locations
Additional Miniwell Locations
Direct-Push (Geoprobe) Sampling Location
UST
Test Pit
Trench or Patched Feature
Support Column
Monitoring Well
Temporary Geoprobe Wells
0 10 20 40
Feet
Gravel Parking
28 Chapin St
GP-1 (1.4 ppm)
GP-1B
GP-40 (0.0 ppm)
Door
TP-03 (20.5 ppm)
GP-2 (7.5 ppm)
GP-3
GP-4 (23.6 ppm)
CO
CO
GP-5 (1.7 ppm)
GP-6 (0.2 ppm)
Scale
GPW-8 (3.5 ppm)
Drainage Inlet
GP-32 (0.5 ppm)
GP-7 (3 ppm)
Sumps
Door
SB-06 (0.0 ppm)
GP-39 (0.0 ppm)
GP-38 (0.0 ppm)
MW-204S
MW-203S
MW-204D
GP-41 (0.0 ppm)
GP-42 (0.0 ppm)
GP-44 (0.0 ppm)
Patched Drainage Feature
GP-11 (0.4 ppm)
GP-9 (1.2 ppm)
GP-10 (1.5 ppm)
GP-43 (70.5 ppm)
GP-12 (0.2 ppm)
Covered Sump
Boiler Blow Down Pit
Patched Drainage Features
Door
Vertical Pipes
GP-14 (6.5 ppm)
MW-202S
GP-13 (9 ppm)
GP-33 (0.0 ppm)
GPW-21 (1305 ppm)
GP-30 (4 ppm)
GP-15 (7.5 ppm)
MW-202D
1"
2"
Pipes
2"
2"
GP-19(W) (8 ppm)
GP-28 (10.1 ppm)
GP-16 (1.8 ppm)
Storage Room
GP-34 (0.0 ppm)
TP-02 (0.0 ppm)
BR-01 (0.0 ppm)
GP-23 (14.2 ppm)
GP-18 (34.4 ppm)
Former Machine Location Patches
Stairwell
GP-17 (1.7 ppm)
GP-27 (103 ppm)
GP-20 (1.2 ppm)
GP-25 (5 ppm)
MW-201D2 (120 ppm)
GP-24 (5.5 ppm)
GP-29 (2.7 ppm)
Structural Column (TYP)
MW-201S
GP-36 (0.0 ppm)
GP-37 (0.0 ppm)
Overhead Door
GP-22 (7.5 ppm)
MW-201D
Covered Sump
Patched Drainage Trenches
Door
MW-200S
Buried Pipe
GP-26 (18 ppm)
Outline of Concrete Patch
GP-35 (100.8 ppm)
TP-04 (0.0 ppm)
TP-01 (300 ppm)
UST Location
GP-31 (1 ppm)
MW-B105A

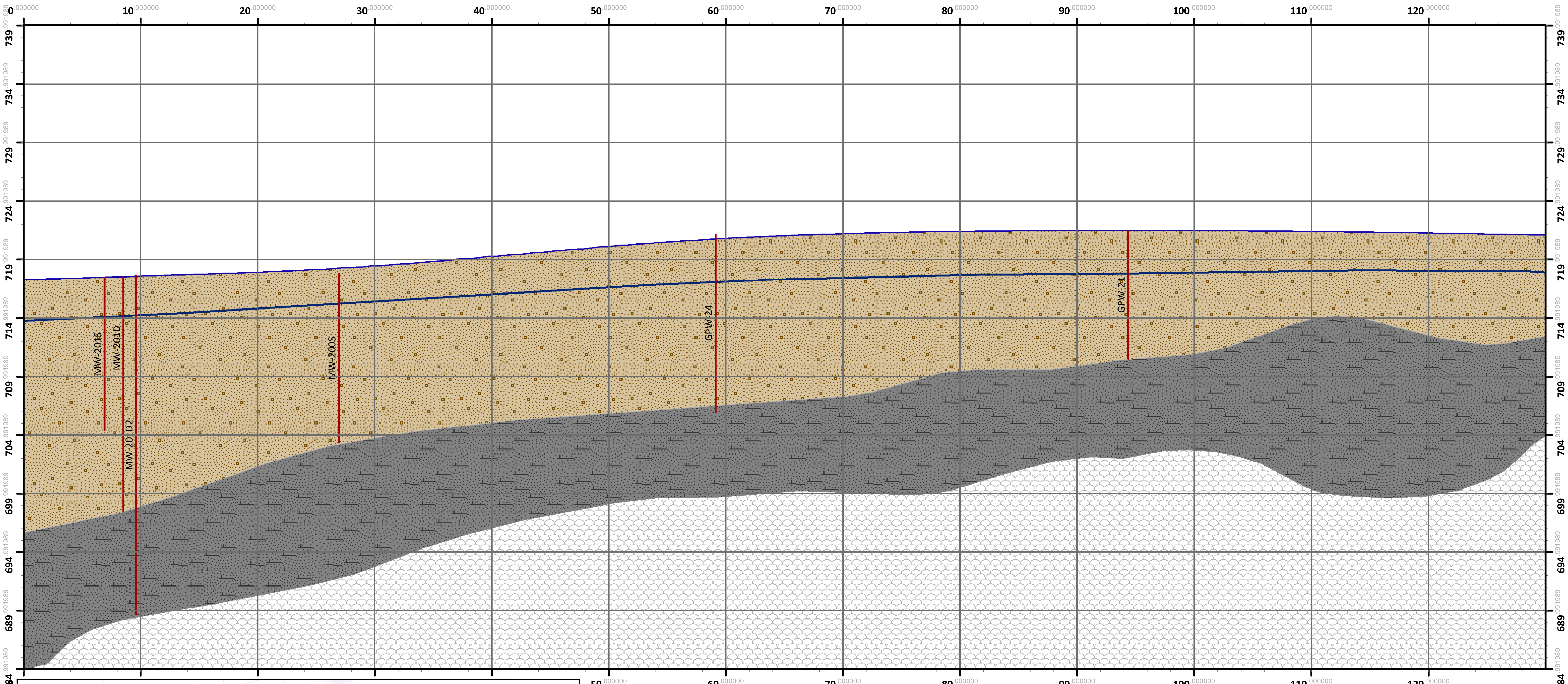


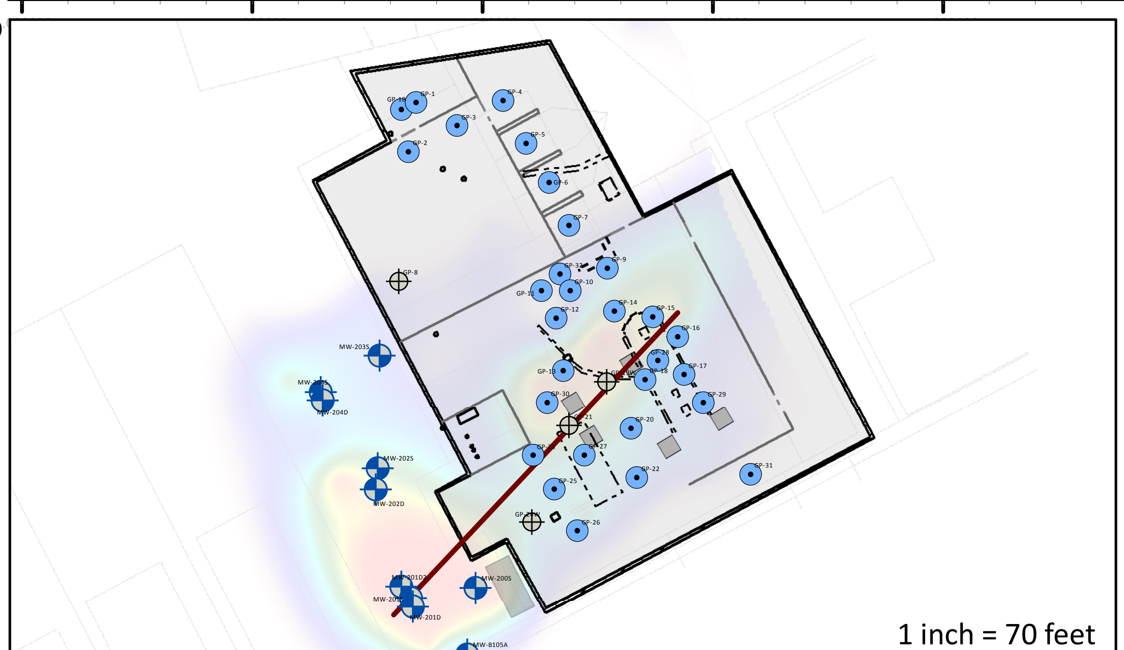
DATE: APRIL 2017
DRAWN/CHECKED: CSB/GLA
1 Inch= 20 Feet
DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering

Figure 6. Trichlorothene Soil Results

Alternative Analysis Report - FORMER LABELON BCP SITE

MacDONALD ENGINEERING





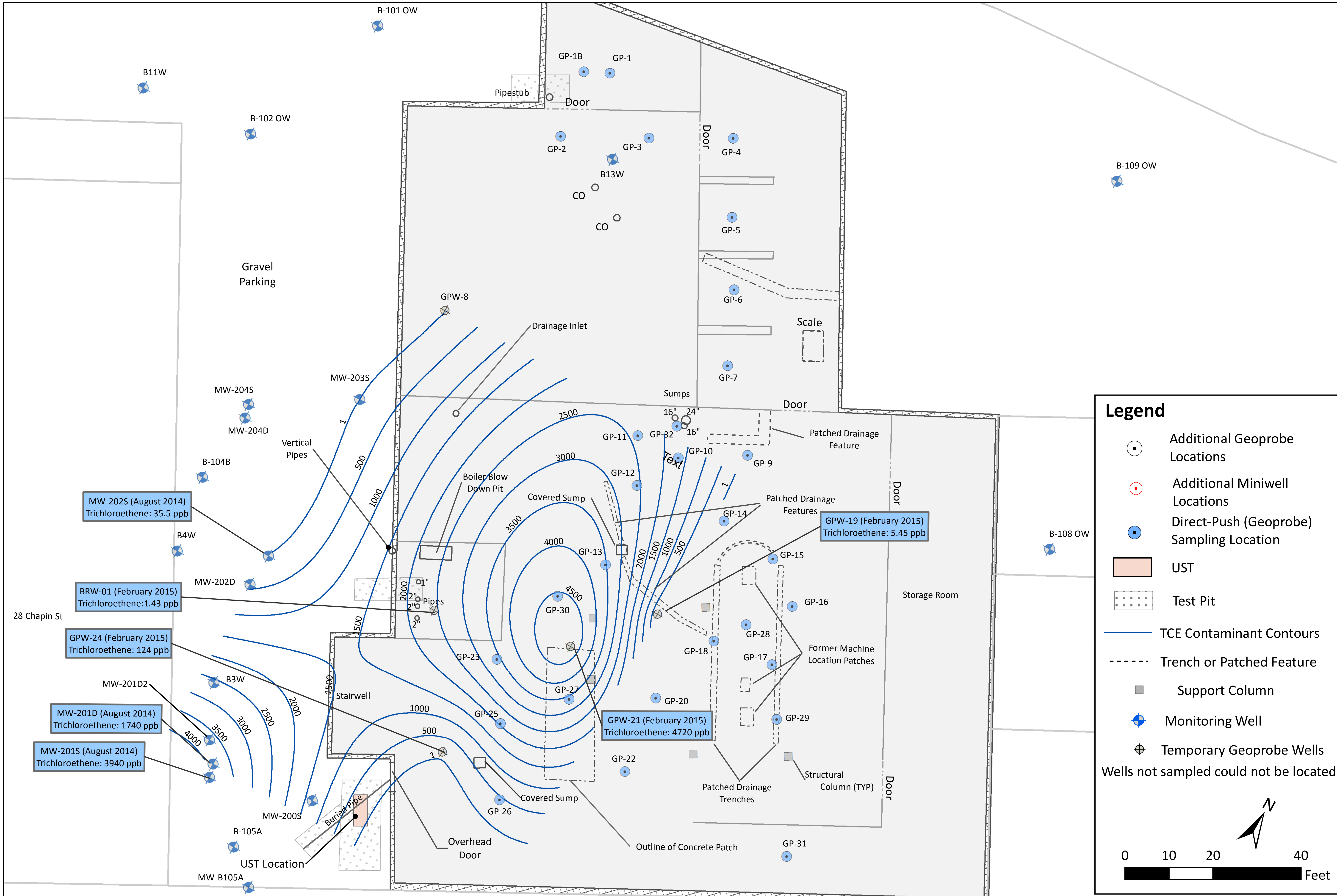
Legend

Monitoring Wells	Possible Bedrock
Ground Surface	Glacial Till
Groundwater Elevation	Coarse Grained Sediment

Feet
0 5 10 20

Figure 7. Soil Cross Section

MacDonald Engineering



DATE: OCTOBER 2016

DRAWN/CHECKED: CSB/GLA

1 Inch= 20 Feet

DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering

Figure 8a. Trichlorothene Groundwater Results 2015

Alternative Analysis Report - FORMER LABELON BCP SITE.

MacDonald Engineering

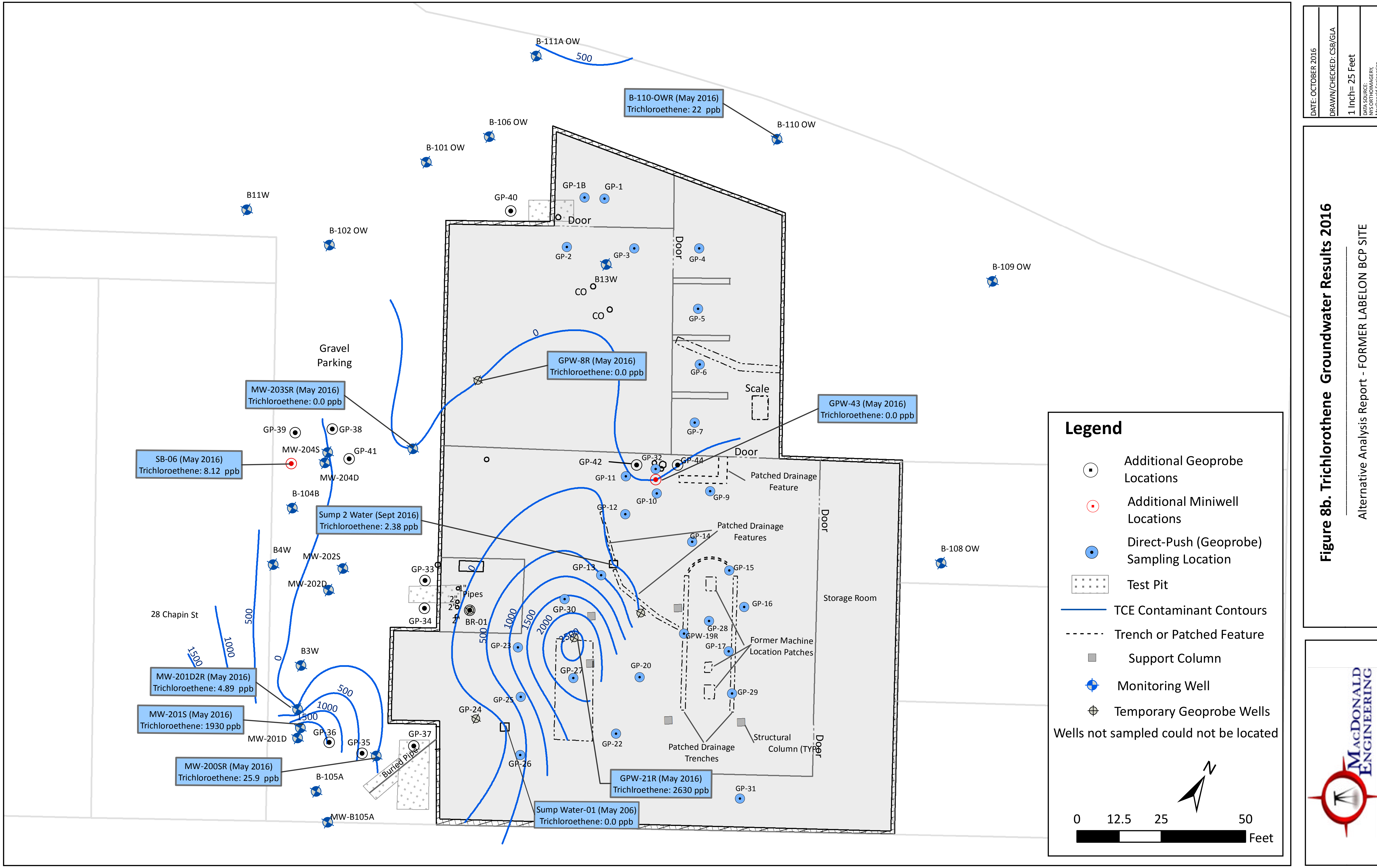
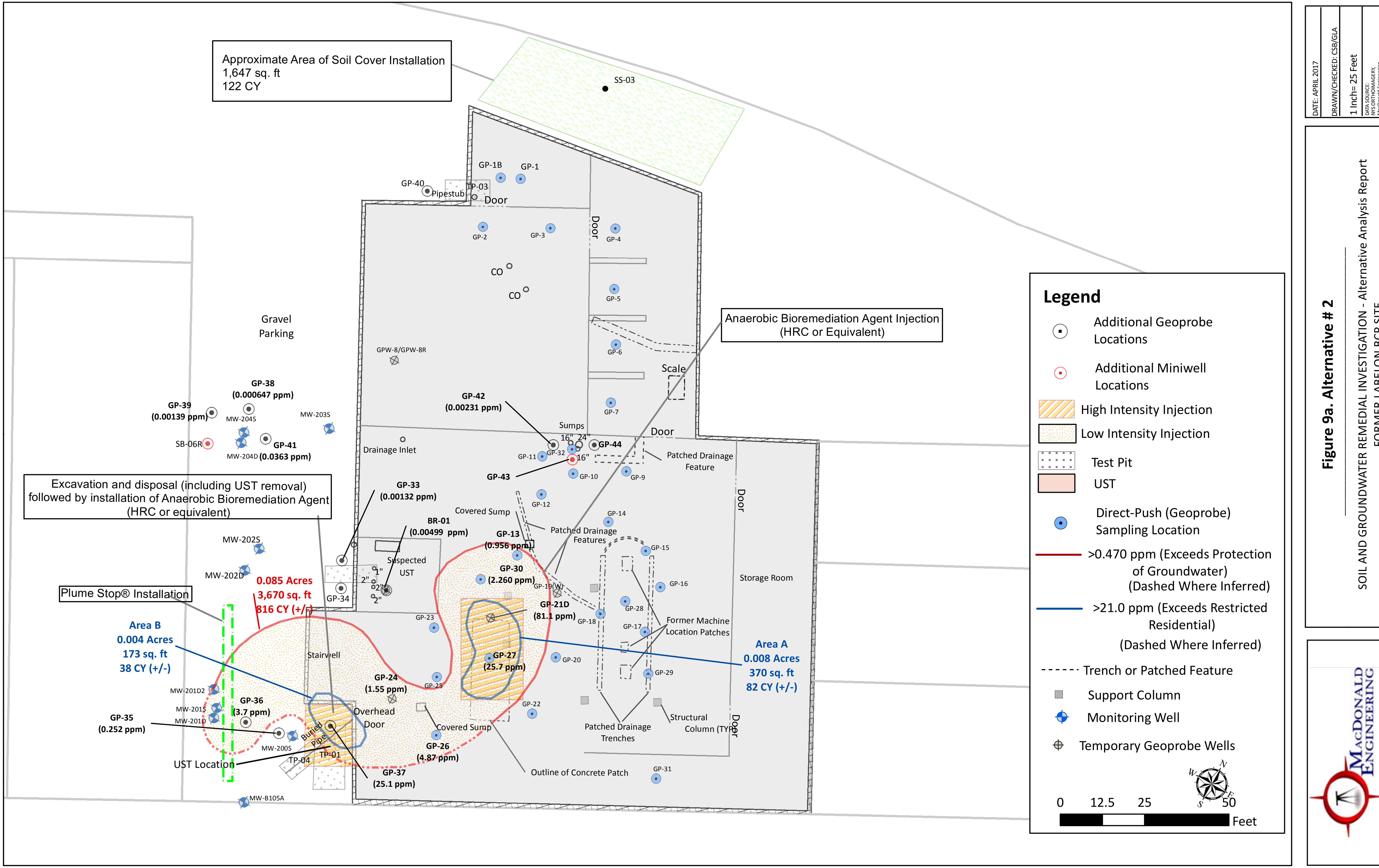
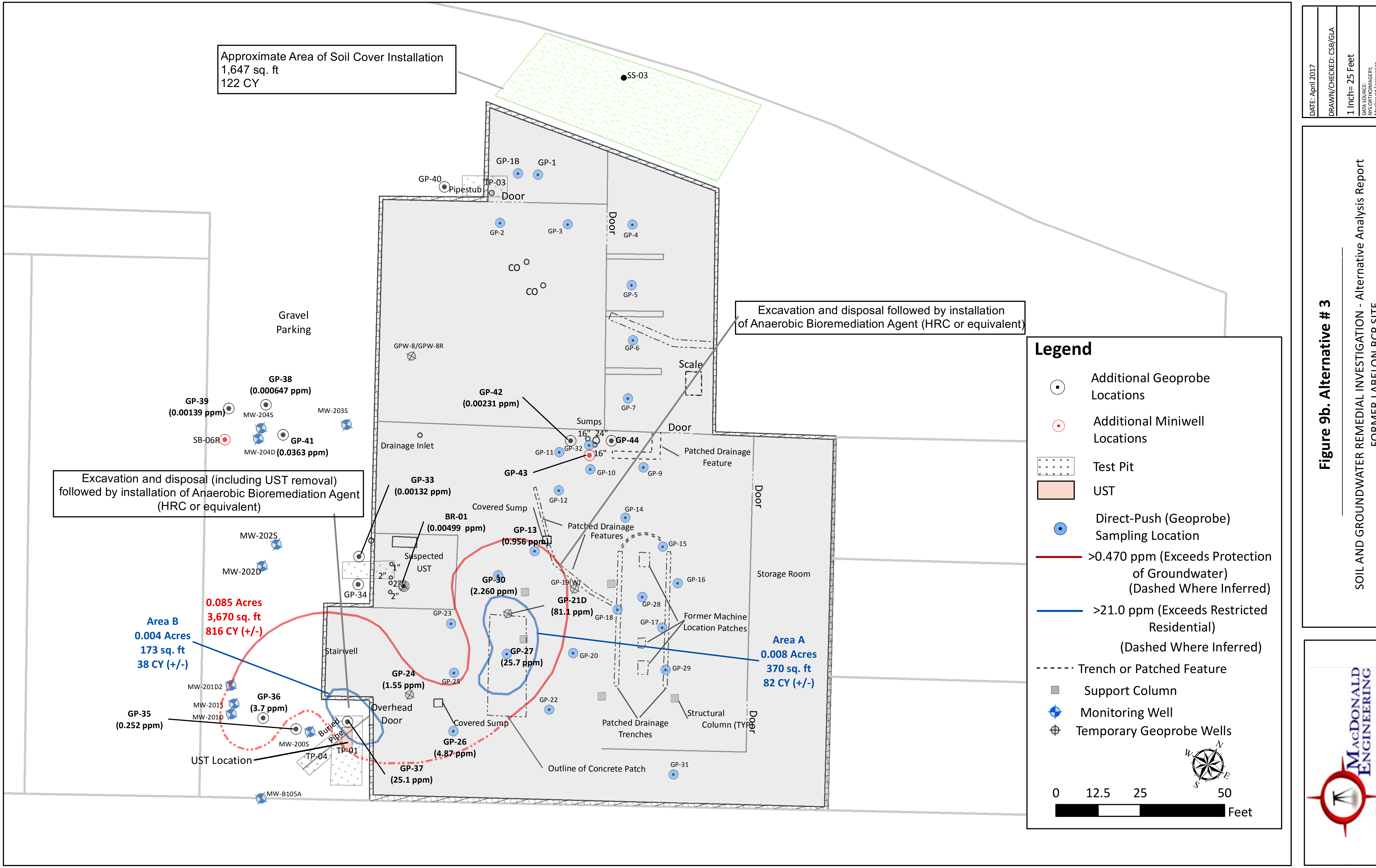


Figure 8b. Trichlorothene Groundwater Results 2016

Alternative Analysis Report - FORMER LABELON BCP SITE



Approximate Area of Soil Cover Installation
1,647 sq. ft
122 CY
SS-03
GP-1B
GP-1
GP-40
Pipestub
TP-03
Door
GP-2
GP-3
GP-4
CO
CO
GP-5
GP-6
Gravel Parking
GPW-8/GPW-8R
Anaerobic Bioremediation Agent Injection
(HRC or Equivalent)
Scale
GP-7
GP-38
(0.000647 ppm)
GP-39
(0.00139 ppm)
MW-204S
MW-203S
SB-06R
GP-41
MW-204D (0.0363 ppm)
GP-42
(0.00231 ppm)
Sumps
16" 24"
GP-44
Door
Drainage Inlet
GP-11
GP-32
16"
Patched Drainage Feature
GP-43
GP-10
GP-9
Excavation and disposal (including UST removal)
followed by installation of Anaerobic Bioremediation Agent
(HRC or equivalent)
GP-33
(0.00132 ppm)
GP-12
Covered Sump
BR-01
(0.00499 ppm)
Patched Drainage Features
GP-14
GP-13
(0.956 ppm)
MW-202S
Suspected UST
GP-15
GP-30
(2.260 ppm)
Storage Room
MW-202D
0.085 Acres
3,670 sq. ft
816 CY (+/-)
GP-34
GP-19(W)
GP-16
Plume Stop® Installation
GP-21D
(81.1 ppm)
GP-18
GP-28
GP-23
Former Machine Location Patches
GP-17
Area B
0.004 Acres
173 sq. ft
38 CY (+/-)
Stairwell
GP-27
(25.7 ppm)
Area A
0.008 Acres
370 sq. ft
82 CY (+/-)
GP-20
GP-24
(1.55 ppm)
GP-25
GP-29
MW-201D2
GP-36
(3.7 ppm)
MW-201S
MW-201D
Overhead Door
GP-22
GP-35
(0.252 ppm)
Buried Pipe
Covered Sump
Structural Column (TYP)
Patched Drainage Trenches
MW-200S
GP-26
(4.87 ppm)
TP-04
TP-01
UST Location
GP-37
(25.1 ppm)
Outline of Concrete Patch
GP-31
MW-B105A
Legend
Additional Geoprobe Locations
Additional Miniwell Locations
High Intensity Injection
Low Intensity Injection
Test Pit
UST
Direct-Push (Geoprobe) Sampling Location
>0.470 ppm (Exceeds Protection of Groundwater) (Dashed Where Inferred)
>21.0 ppm (Exceeds Restricted Residential) (Dashed Where Inferred)
Trench or Patched Feature
Support Column
Monitoring Well
Temporary Geoprobe Wells
0 12.5 25 50
Feet
DATE: APRIL 2017
DRAWN/CHECKED: CSB/GLA
1 Inch= 25 Feet
DATA SOURCE: NYS ORTHOIMAGERY, MacDonald Engineering
Figure 9a. Alternative # 2
SOIL AND GROUNDWATER REMEDIAL INVESTIGATION - Alternative Analysis Report
FORMER LABELON BCP SITE.
MacDonald Engineering



Approximate Area of Soil Cover Installation
1,647 sq. ft
122 CY
SS-03
GP-1B
GP-1
GP-40
Pipestub
TP-03
Door
GP-2
GP-3
GP-4
CO
CO
GP-5
GP-6
GP-7
Scale
Excavation and disposal followed by installation of Anaerobic Bioremediation Agent (HRC or equivalent)
Gravel Parking
GPW-8/GPW-8R
GP-38 (0.000647 ppm)
GP-39 (0.00139 ppm)
MW-204S
MW-203S
SB-06R
GP-41
MW-204D (0.0363 ppm)
GP-42 (0.00231 ppm)
Sumps
16"
24"
GP-44
GP-11
GP-32
16"
Door
Patched Drainage Feature
Drainage Inlet
GP-43
GP-10
GP-9
Excavation and disposal (including UST removal) followed by installation of Anaerobic Bioremediation Agent (HRC or equivalent)
GP-33 (0.00132 ppm)
Covered Sump
GP-12
BR-01 (0.00499 ppm)
GP-13 (0.956 ppm)
Patched Drainage Features
GP-14
GP-15
Suspected UST
MW-202S
MW-202D
GP-34
GP-30 (2.260 ppm)
GP-19(W)
GP-16
Storage Room
GP-21D (81.1 ppm)
GP-18
GP-28
0.085 Acres
3,670 sq. ft
816 CY (+/-)
Area B
0.004 Acres
173 sq. ft
38 CY (+/-)
GP-23
GP-17
Former Machine Location Patches
Area A
0.008 Acres
370 sq. ft
82 CY (+/-)
Stairwell
GP-27 (25.7 ppm)
GP-20
GP-24 (1.55 ppm)
GP-25
GP-29
MW-201D2
GP-36 (3.7 ppm)
MW-201S
MW-201D
GP-35 (0.252 ppm)
Overhead Door
Covered Sump
GP-22
Structural Column (TYP)
Patched Drainage Trenches
Buried Pipe
MW-200S
TP-04
TP-01
UST Location
GP-26 (4.87 ppm)
GP-37 (25.1 ppm)
Outline of Concrete Patch
GP-31
MW-B105A
Legend
Additional Geoprobe Locations
Additional Miniwell Locations
Test Pit
UST
Direct-Push (Geoprobe) Sampling Location
>0.470 ppm (Exceeds Protection of Groundwater) (Dashed Where Inferred)
>21.0 ppm (Exceeds Restricted Residential) (Dashed Where Inferred)
Trench or Patched Feature
Support Column
Monitoring Well
Temporary Geoprobe Wells
0
12.5
25
50
Feet
DATE: April 2017
DRAWN/CHECKED: CSB/GLA
1 Inch= 25 Feet
Figure 9b. Alternative # 3
SOIL AND GROUNDWATER REMEDIAL INVESTIGATION - Alternative Analysis Report
FORMER LABELON BCP SITE.
MacDonald Engineering

Table 1
Former Labelon Facility
Canandaigua, New York
Alternatives Analysis Report

Soil and Sediment Results - VOCs, SVOCs, and Pesticides

Detected Parameters[1]	Unrestricted Use[2]	Restricted Residential[3]	Protection of Groundwater[3]	GP2-15'	GP13-6'	GP14-10'	GP18-16.5'	GP21-10'	GP21-10'D	GP24-8'	GP26-6'	GP27-8'	GP30-6'	GP32-4'
			Date Sampled	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15	Feb-15
EPA 8260 - Volatile Organics														
tert-butylbenzene	5,900	100,000	5,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-propylbenzene	3,900	100,000	3,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-butylbenzene	11,000	100,000	11,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-trimethylbenzene	3,600	52,000	3,600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-trimethylbenzene	8,400	52,000	8,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	1,800	13,000	1,800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloroethane	20	3,100	20	ND	ND	ND	**1.02**	ND	ND	ND	ND	ND	ND	ND
chlorobenzene	1,100	100,000	1,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	2,400	49,000	2,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	250	100,000	250	ND	ND	ND	ND	ND	ND	ND	ND	ND	**116**	ND
trans-1,2-dichloroethene	190	100,000	190	ND	ND	ND	**0.947**	ND	ND	**106**	ND	ND	ND	ND
2-butanone	120	100,000	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
acetone	50	100,000	50	**5.97**	ND	ND	**7.9**	ND	**4,790**	ND	ND	ND	ND	**11**
benzene	60	4,800	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethylbenzene	1,000	41,000	1,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
dichlorodiflouromethane	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-isopropyltoluene	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methylcyclohexane	NA	NA	NA	**3.05**	ND	ND	**1.73**	ND	ND	ND	ND	ND	**113**	ND
methyl acetate	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methylene chloride	50	100,000	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tetrachloroethene	1,300	19,000	1,300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
toluene	700	100,000	700	**6.74**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trichloroethene	470	21,000	470	**2.02**	**956**	ND	**65.2**	**45,800**	**81,100**	**1,550**	**4,870**	**25,700**	**2,260**	ND
m,p-xylene	260	100,000	1,600	**1.14**	ND	ND	**0.831**	ND	ND	ND	ND	ND	ND	ND
Total Reported VOC TICS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8270- Semi-Volatile Organics														
Acenaphthene	20,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Acenaphthylene	100,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Anthracene	100,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Benzo(a) anthracene	1,000	1,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Benzo(a) pyrene	1,000	1,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Benzo(b) fluoranthene	1,000	1,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Benzo(g,h,i) perylene	100,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Benzo(k) fluoranthene	800	3,900	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	NA	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Chrysene	1,000	3,900	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Dibenz(a,h) anthracene	330	330	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Fluoranthene	100,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Fluorene	30,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Indeno(1,2,3-cd) pyrene	500	500	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Phenanthrene	100,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Pyrene	100,000	100,000	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
Total Reported SVOC TICS	NA	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
EPA 8081- Pesticides														
4,4- DDD	3	13,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDT	3	7,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDE	3	8,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	5	97	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	36	360	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	5	200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	2,400	24,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	2,400	24,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	14	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Ketone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1 - All values presented in micrograms per kilogram (ug/kg).
2- 6 NYCRR Part 375-6.8(a): Unrestricted Use SCOs
3- 6 NYCRR Part 375-6.8(b): Restricted Use SCOs
ND- Not detected above reporting limit
NA - Not Applicable/Not Analyzed
B-compound detected in associated method blank
J-compound detected below quantitation limit; value is estimated.
M-matrix spike recoveries outside QC limits; bias indicated.
P-result differs by > 40% between the primary and secondary columns.

Value Exceeds Restricted-Residential SCOs
Value Exceeds Unrestricted SCOs
Value Exceeds Protection of Groundwater SCOs

Table 1
Former Labelon Facility
Canandaigua, New York
Alternatives Analysis Report

Soil Results - VOCs, SVOCs, Pesticides - Labelon Site

Detected Parameters[1]	Unrestricted Use[2]	Restricted Residential[3]	Protection of Groundwater[3]	SS-01	SS-02	SS-03	GP33-8'	GP35-6'	GP36-6'	GP37-5'	GP38-6'	GP39-6.5'	GP40-12'	GP41-8'	GP42-8'	GP43-4'	BR-01
			Date Sampled	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16
EPA 8260 - Volatile Organics																	
tert-butylbenzene	5,900	100,000	5,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-propylbenzene	3,900	100,000	3,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-butylbenzene	11,000	100,000	11,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-trimethylbenzene	3,600	52,000	3,600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-trimethylbenzene	8,400	52,000	8,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	1,800	13,000	1,800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichloroethane	20	3,100	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
chlorobenzene	1,100	100,000	1,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	2,400	49,000	2,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-dichloroethene	250	100,000	250	ND	ND	ND	ND	ND	ND	ND	**0.842 J**	ND	ND	**3.44**	ND	ND	ND
trans-1,2-dichloroethene	190	100,000	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-butanone	120	100,000	120	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
acetone	50	100,000	50	ND	ND	ND	**18.0**	ND	ND	ND	**13.5**	ND	**24.5**	**86.8**	ND	ND	ND
benzene	60	4,800	60	ND	ND	ND	ND	**928**	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethylbenzene	1,000	41,000	1,000	ND	ND	ND	ND	**2,510**	ND	ND	**2.02**	ND	ND	**3.64**	ND	ND	ND
dichlorodiflouromethane	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
carbon disulfide	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	**1.34**	ND	ND	ND	ND	ND	ND
Isopropylbenzene	NA	NA	NA	ND	ND	ND	**1.83**	**1210**	ND	ND	ND	ND	ND	ND	ND	**2120**	ND
p-isopropyltoluene	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cyclohexane	NA	NA	NA	ND	ND	ND	ND	**6,560**	ND	ND	**2.96 J**	ND	ND	ND	ND	ND	ND
methylcyclohexane	NA	NA	NA	ND	ND	ND	**2.45**	**21,200**	ND	ND	**5.13**	ND	ND	ND	ND	ND	ND
methyl acetate	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
methylene chloride	50	100,000	50	ND	ND	ND	ND	ND	**303 J**	ND	ND	ND	ND	ND	ND	ND	ND
tetrachloroethene	1,300	19,000	1,300	ND	ND	**1.03 JM**	ND	ND	ND	ND	ND	**0.619 J**	ND	**4.07**	ND	ND	ND
toluene	700	100,000	700	ND	ND	ND	ND	**1,610**	ND	ND	**5.87**	ND	**1.41 J**	ND	ND	ND	ND
o-Xylene	NA	NA	NA	ND	ND	ND	ND	**535**	ND	ND	**0.916 J**	ND	ND	**18.2**	ND	ND	ND
trichloroethene	470	21,000	470	ND	ND	ND	**1.32**	**252 J**	**3,700**	**25,100**	**0.647 J**	**1.39**	ND	**36.3**	**2.31**	ND	**4.99**
m,p-xylene	260	100,000	1,600	ND	ND	ND	ND	**8,650**	ND	ND	**5.02**	ND	ND	**15.4**	ND	ND	ND
Total Reported VOC TICS	NA	NA	NA	**205**	**173**	**4.77**	**476**	**301,000**	ND	ND	**78.3**	**4.06**	ND	**137**	ND	**44,500**	**199**
EPA 8270- Semi-Volatile Organics																	
Acenaphthene	20,000	100,000	NA	ND	ND	**255 J**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Acenaphthylene	100,000	100,000	NA	ND	ND	**470**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Anthracene	100,000	100,000	NA	ND	ND	**916**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Benzo(a) anthracene	1,000	1,000	NA	**178 J**	ND	**2,420**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Benzo(a) pyrene	1,000	1,000	NA	**222 J**	ND	**2,420**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Benzo(b) fluoranthene	1,000	1,000	NA	**232 J**	ND	**3,110**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Benzo(g,h,i) perylene	100,000	100,000	NA	**184 J**	ND	**1,390**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Benzo(k) fluoranthene	800	3,900	NA	**222 J**	ND	**1,730**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Bis(2-ethylhexyl) phthalate	NA	NA	NA	ND	ND	**808**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Carbazole	NA	NA	NA	ND	ND	**407**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Chrysene	1,000	3,900	NA	**253 J**	ND	**2,760**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Dibenz(a,h) anthracene	330	330	NA	ND	ND	**490**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Fluoranthene	100,000	100,000	NA	**418**	ND	**4,570**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Fluorene	30,000	100,000	NA	ND	ND	**238 J**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Indeno(1,2,3-cd) pyrene	500	500	NA	**214 J**	ND	**1,690**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Phenanthrene	100,000	100,000	NA	**213 J**	ND	**2,500**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Pyrene	100,000	100,000	NA	**384**	ND	**4,500 M**	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	ND
Total Reported SVOC TICS	NA	NA	NA	**5210**	**5890**	**10,100**	**1060**	NA	NA	NA	NA	NA	**2070**	NA	NA	NA	**509**
EPA 8081- Pesticides																	
4,4- DDD	3.3	13,000	NA	**3.07 J**	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDT	3.3	7,900	NA	**5**	**1.88 JP**	**30.5 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDE	3.3	8,900	NA	ND	ND	**7.63 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	5	97	NA	ND	ND	**2.3 JPM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	36	360	NA	ND	ND	**2.36 JP**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	5	200	NA	ND	ND	**5.43 P**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-Chlordane	NA	NA	NA	**3.85**	**1.73 J**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	2,400	24,000	NA	ND	ND	**31.9 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan Sulfate	2,400	24,000	NA	**5.59 P**	**3.05 JP**	**45.6 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	14	11,000	NA	ND	ND	**12.0 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	NA	NA	NA	**3.06 J**	**2.42 J**	**13.8 M**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Ketone	NA	NA	NA	ND	ND	**8.35 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Chlordane	NA	NA	NA	ND	ND	**6.56 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	**12**	**4.33 P**	**6.2 PM**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1 - All values presented in micrograms per kilogram (ug/kg).
2- 6 NYCRR Part 375-6.8(a): Unrestricted Use SCOs
3- 6 NYCRR Part 375-6.8(b): Restricted Use SCOs
ND- Not detected above reporting limit
NA - Not Applicable/Not Analyzed
B-compound detected in associated method blank
J-compound detected below quantitation limit; value is estimated.
M-matrix spike recoveries outside QC limits; bias indicated.
P-result differs by > 40% between the primary and secondary columns.

Value Exceeds Restricted-Residential SCOs
Value Exceeds Unrestricted SCOs
Value Exceeds Protection of Groundwater SCOs

Table 2
Former Labelon Facility
Canandaigua, New York
Alternatives Analysis Report

Soil and Sediment Results- Metals

Detected Parameters[1]	Unrestricted Use[2]	Restricted Residential[3]	GP5-5'	GP7-4'	GP21-10'	GP32-2-4'	GP-32 Sump Sediment	SS-01	SS-02	SS-03	GP38-6'	GP39-6.5'	GP40-12'	GP41-8'	GP42-8'	GP43-4'
		Date Sampled	Feb-15	Feb-15	Feb-15	Feb-15	Sep-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16	May-16
TAL Metals																
Aluminum	NA	NA	**5,440**	**6,290**	**7,310**	**8,830**	NA	**2,680**	**2,920**	**5,320**	NA	NA	NA	NA	**5,050**	**7,020**
Antimony	NA	NA	ND	ND	**6.44**	**12.5**	NA	ND	ND	ND	NA	NA	NA	NA	ND	ND
Arsenic	13	16	**6**	**9.87**	**5.02**	**11.6**	NA	**3.03**	**3.07**	**4.71**	NA	NA	NA	NA	**3.73**	**3.89**
Barium	350	400	**42.9**	**430**	**51.4**	**71.5**	NA	**24.7**	**20.3**	**77.9**	NA	NA	NA	NA	**27.6**	**63.8**
Beryllium	7.2	72	ND	ND	**0.35**	**0.6**	NA	ND	**0.176 J**	**0.296 J**	NA	NA	NA	NA	**0.308**	**0.307**
Cadmium	2.5	4.3	ND	ND	ND	ND	NA	ND	ND	**0.339**	NA	NA	NA	NA	ND	ND
Calcium	NA	NA	**99,600**	**169,000**	**78,000**	**32,600**	NA	**168,000**	**175,000**	**95,300 D**	NA	NA	NA	NA	**115,000**	**40,100**
Chromium	30	180	**12.2**	**11.7**	**14.2**	**215**	NA	**7.97**	**7.04**	**83.5**	NA	NA	NA	NA	**10.6**	**11**
Chromium, Hexavalent	1	110	NA	NA	NA	NA	**0.48 J**	NA	NA	NA	**0.27 J**	**0.5 J**	ND	ND	ND	ND
Cobalt	NA	NA	**4.98**	**5.04**	**6.26**	**11.5**	NA	**3.93**	**3.8**	**5.81**	NA	NA	NA	NA	**5.03**	**4.36**
Copper	50	270	**14.00**	**15.5**	**24**	**27.4**	NA	**14.4**	**11.8**	**39**	NA	NA	NA	NA	**53.2**	**167**
Iron	NA	NA	**12,400**	**10,800**	**14,700**	**75,400**	NA	**6,420**	**5,750**	**13,500**	NA	NA	NA	NA	**11,500**	**12,900**
Lead	63	400	**5.01**	**2.92**	**5.68**	**26.6**	NA	**41.4**	**23**	**62.2**	NA	NA	NA	NA	**7.59**	**4.6**
Magnesium	NA	NA	**12,500**	**49,100**	**13,500**	**12,100**	NA	**15,200**	**14,000**	**8,040**	NA	NA	NA	NA	**28,700**	**12,200**
Manganese	1,600	2,000	**298**	**390**	**329**	**934**	NA	**350**	**268**	**339**	NA	NA	NA	NA	**319**	**434**
Mercury	0.18	0.81	**0.0164**	**0.0394**	**0.0123**	**0.0692**	NA	**0.0376**	**0.027**	**0.183 M**	NA	NA	NA	NA	**0.0141**	**0.0162**
Nickel	30	310	**15.9**	**14.3**	**20.2**	**139**	NA	**9.94**	**9.43**	**55.9**	NA	NA	NA	NA	**20.1**	**11.6**
Potassium	NA	NA	**1,370**	**1,750**	**2,060**	**2,070**	NA	**1,170**	**1,320**	**1,090**	NA	NA	NA	NA	**1,370**	**1,800**
Selenium	3.90	180	**2.57**	**7.21**	**3.34**	ND	NA	ND	ND	ND	NA	NA	NA	NA	ND	ND
Silver	2	180	**4.48**	**19.1**	**ND**	ND	NA	**1.45**	ND	**29**	NA	NA	NA	NA	ND	ND
Sodium	NA	NA	**255**	**367**	**289**	**413**	NA	**290**	**217**	**148 J**	NA	NA	NA	NA	**292**	**285**
Thallium	NA	NA	ND	ND	ND	ND	NA	**3.9**	**4.32**	ND	NA	NA	NA	NA	**2**	ND
Vanadium	NA	NA	**13.4**	**15**	**16.2**	**19.9**	NA	**7.9**	**7.79**	**11.8**	NA	NA	NA	NA	**15.9**	**15.5**
Zinc	109	10,000	**43**	**33.7**	**60.7**	**6,450**	NA	**61.8**	**47.9**	**179**	NA	NA	NA	NA	**49.6**	**43.6**
Solids, total (%)	NA	NA	NA	NA	NA	NA	**82**	NA	NA	NA	**85**	**81.40**	**84.4**	**59.9**	**88**	**84.2**

1 - results presented in milligrams per kilogram (mg/kg)
2- 6 NYCRR Part 375-6.8(a): Unrestricted Use SCOs
3- 6 NYCRR Part 375-6.8(b): Restricted Use SCOs
ND- Not detected above reporting limit
NA - Not Applicable/Not Analyzed
B-compound detected in associated method blank
J-compound detected below quantitation limit; value is estimated.
M-matrix spike recoveries outside QC limits; bias indicated.
P-result differs by > 40% between the primary and secondary columns.

Value Exceeds Restricted-Residential SCOs (Barium GP7-4' 430; Chromium GP32-2-4' 215 highlighted orange)
Value Exceeds Unrestricted SCOs

Table 3
Former Labelon Facility
Canandaigua, New York
Alternatives Analysis Report

Soil Results- PCBs

Detected Parameters[1]	Unrestricted Use[2]	Restricted Residential[3]	GP21-10'	GP32-2-4'	SS-01	SS-02	SS-03	BR-01
		Date sampled	Feb-15	Feb-15	May-16	May-16	May-16	May-16
PCBS BY EPA 8082								
PCB-1016	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1221	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1232	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1242	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1248	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1254	0.1	1.0	ND	ND	ND	ND	**0.215**	ND
PCB-1260	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1262	0.1	1.0	ND	ND	ND	ND	ND	ND
PCB-1268	0.1	1.0	ND	ND	ND	ND	ND	ND

1 - results presented in milligrams per kilogram (mg/kg)
2- 6 NYCRR Part 375-6.8(a): Unrestricted Use SCOs for Total PCBs
3- 6 NYCRR Part 375-6.8(b): Restricted Use SCOs for Total PCBs
ND- Not detected above reporting limit
NA - Not Applicable/Not Analyzed
B-compound detected in associated method blank
J-compound detected below quantitation limit; value is estimated.
M-matrix spike recoveries outside QC limits; bias indicated.
P-result differs by > 40% between the primary and secondary columns.

Value Exceeds Restricted-Residential SCOs
Value Exceeds Unrestricted SCOs

Table 4
Former Labelon Facility
Canandaigua, New York
Alternatives Analysis Report

Groundwater Results-TCL VOCs and SVOCs

Detected Parameters[1]	NYS Groundwater Standard Class GA[2]	MW201S-12.5'	MW201S	MW201D-18.5'	MW201D2R	MW202S-12.5'	MW202D-18.5'	BRW-01	GPW-8	GPW-8R	GPW-19	GPW-19R	GPW-24	SB-06	GPW-21	GPW-21R	MW-203SR	MW-200SR	MW-204D	MW-204S	GPW-43	GPW-32 Sump Water	GPW-32 Sump Sediment	Sump Water-01	Sump 2 Water	B-110-OWR
	Date Sampled:	Aug-14	Sep-16	Aug-14	May-16	Aug-14	Aug-14	Feb-15	Feb-15	May-16	Feb-15	May-16	Feb-15	May-16	Feb-15	May-16	May-16	May-16	Sep-16	Sep-16	May-16	May-16	May-16	May-16	Sep-16	May-16
EPA 8260 - Volatile Organics																										
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.44**	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	**14.6 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.95**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.47 J**	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.67**	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	50*	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.77**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**330**	**11.4**	ND	ND	ND	ND
Benzene	1	ND	**6.87 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**107**	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5*	**128**	**126**	**63.8**	ND	**7.68**	ND	ND	ND	ND	ND	ND	**44.3**	ND	ND	**45.2**	ND	**9.03**	ND	**11.6**	ND	ND	ND	ND	ND	ND
Cyclohexane	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**87.8**	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**36.8**	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl Ether	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylcyclohexane	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**71.4**	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.05**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.47 J**
Toluene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**78.7**	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	**40.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**70.4**	ND	ND	ND	ND	**23**	ND	**5.27**	ND	ND	ND	ND	ND	ND
Trichloroethene	5	**3,940**	**1,930**	**1,740**	**4.89**	**35.5**	ND	**1.43**	**ND**	ND	**5.45**	**2.17**	**124**	**8.12**	**4720**	**2630**	ND	**25.9**	ND	**3.59**	ND	ND	ND	ND	**2.38**	**22**
Isopropylbenzene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.9**	ND	ND	**12.1**	ND	ND	ND	ND	ND
m,p-Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**57.4**	ND	ND	**6.24**	ND	ND	ND	ND	ND
o-Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**18.2**	ND	ND	**7.3**	ND	ND	ND	ND	ND
Xylenes (total)	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	**32.3**	ND	ND	**3.84**	ND	ND	**3.67**	**2.17**	ND	ND	**5.11**	ND	ND	ND	ND	**2.19**	ND	**6.04**	ND	ND	ND	ND	ND	ND
Total Reported VOC TICs	-	**4068**	**390**	**1803.8**	ND	**49.14**	ND	NA	NA	ND	NA	ND	ND	ND	ND	ND	ND	**825**	ND	**62.7**	**90.8**	**5.84**	**21.7**	ND	ND	**12.5**
EPA 8270- Semi-Volatile Organics																										
Acenaphthylene	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**24.5**	NA	NA
Anthracene	50*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**34.2**	NA	NA
Benz(a) anthracene	0.002*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**115**	NA	NA
Benzo(a) pyrene	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	**96.5**	NA	NA
Benzo(a) fluoranthene	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**115**	NA	NA
Benzo(g,h,i) perylene	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**67.7**	NA	NA
Benzo(k) fluoranthene	0.002*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**63.1**	NA	NA
Carbazole	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**17.5 J**	NA	NA
Chrysene	0.002*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**112**	NA	NA
Dibenz(a,h) anthracene	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**15.8 J**	NA	NA
Fluoranthene	50*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**265**	NA	NA
Indeno(1,2,3-cd) pyrene	0.002*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**78.4**	NA	NA
Phenanthrene	50*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**150**	NA	NA
Pyrene	50*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**210 M**	NA	NA
Total Reported SVOC TICS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**239**	NA	NA

1 - All values presented in micrograms per liter (µg/L).
2 - NYS Ambient Groundwater Standard (6 NYCRR Part 703.5)
[shaded] Value Exceeds NYS Ambient Groundwater Standards
ND - not detected above method detection limit
* - NYSDEC Guidance Value (TOGS 1.1.1)
J - compound detected below the laboratory quantitation limit
B - compound detected in associated method blank
M- matrix spike recoveries outside QC limits. Matrix bias indicated

Table 5
Former Labelon Facility
Canandaigua, New York
Alternatives Analysis Report

Groundwater Results- Metals and PCBs

Detected Parameters[1]	**NYS Groundwater Standard Class GA[2]**	**SB-06**	**GPW-43**	**Sump Water-01**	**Sump 2 Water**	**GPW-32 Sump Sediment**	**GPW-32 Sump Water**
	Date Sampled	May-16	May-16	May-16	Sep-16	May-16	May-16
EPA 6010-Metals[3]							
Aluminum	-	NA	**6.52**	**0.981**	**0.272**	**86.4**	**0.146 J**
Antimony	0.003	NA	ND	ND	ND	**0.197**	ND
Arsenic	0.025	NA	**0.0107**	**0.0123**	ND	**0.0643**	**0.0115**
Barium	1	NA	**0.364**	**0.887**	**0.425**	**12.1**	**0.381**
Berylium	0.003*	NA	ND	ND	ND	**0.0045 J**	ND
Cadmium	0.005	NA	ND	ND	ND	**0.0991**	ND
Calcium	-	NA	**354**	**136**	**211**	**3030**	**465**
Chromium	0.05	NA	**0.46**	**0.0439**	**0.0225 D**	**8.3**	**0.0124**
Chromium, Hexavalent	0.05	ND	ND	NA	NA	NA	ND
Cobalt	-	NA	ND	ND	ND	**0.142**	ND
Copper	0.2	NA	**0.0215 J**	**0.0763**	**0.105**	**4.24**	ND
Iron	0.3	NA	**14.9**	**63.4**	**5.91**	**260**	**1.33**
Lead	0.025	NA	**0.0139**	**0.0642**	**0.0574**	**3.45**	**0.00690 J**
Magnesium	35*	NA	**84.9**	**6.44**	**41.2**	**328**	**152**
Manganese	0.3	NA	**0.812**	**0.594**	**0.2**	**7.54**	**0.104 D**
Mercury	0.0007	NA	ND	ND	ND	**0.000252**	ND
Nickel	0.1	NA	**0.0319 J**	**0.0211 J**	**0.0372 J**	**8.46**	ND
Potassium	-	NA	**15.9**	**6.14**	**9.03**	**23.9**	**7.27**
Selenium	0.01	NA	ND	ND	ND	ND	ND
Silver	0.05	NA	ND	ND	**0.0274**	**1.91**	ND
Sodium	20	NA	**404**	**7.84**	**683**	**740**	**712**
Thallium	0.0005*	NA	ND	ND	ND	**0.0715**	ND
Vanadium	-	NA	**0.0135 J**	**0.0232 J**	ND	**0.193**	ND
Zinc	2*	NA	**0.162**	**5.45**	**0.811**	**59.3**	**0.151**
EPA 8082-PCBs[1]							
PCB-1016	0.09 [4]	NA	NA	ND	NA	NA	NA
PCB-1221	0.09	NA	NA	ND	NA	NA	NA
PCB-1232	0.09	NA	NA	ND	NA	NA	NA
PCB-1242	0.09	NA	NA	ND	NA	NA	NA
PCB-1248	0.09	NA	NA	ND	NA	NA	NA
PCB-1254	0.09	NA	NA	ND	NA	NA	NA
PCB-1260	0.09	NA	NA	ND	NA	NA	NA
PCB-1262	0.09	NA	NA	ND	NA	NA	NA
PCB-1268	0.09	NA	NA	ND	NA	NA	NA

1 - All values presented in micrograms per liter (µg/L).
2 - NYS Ambient Groundwater Standard (6 NYCRR Part 703.5)
3- All values for metals are presented in milligrams per liter (mg/L)
4- Applies to the sum of these substances
[shaded box] Value Exceeds NYS Ambient Groundwater Standards
ND - not detected above method detection limit
* - NYSDEC Guidance Value (TOGS 1.1.1)
D- Sample results above Relative Percent Difference Limit
J - compound detected below the laboratory quantitation limit
B - compound detected in associated method blank

MacDonald Engineering

Table A - Former Labelon Site (NYSDEC # C835016), 10 Chapin Street Canandaigua, New York

Cost Estimate for Alternative #2, Impacted Soils Removal and In-Situ Soil and Groundwater Remediation to Restricted Residential and Protection of Groundwater Standards

Lu Engineers 5/2/17

Professional	Rates	Hours	Labor Costs
Task 1 - AA Approval			
Project Scientist	$ 115.00	4	$ 460.00
Specialist	$ 80.00	16	$ 1,280.00
Technician	$ 55.00	12	$ 660.00
Task Labor Total			$ 2,400.00
Task 2 - RAWP Completion			
Project Scientist	$ 115.00	16	$ 1,840.00
Specialist	$ 80.00	40	$ 3,200.00
Technician	$ 55.00	48	$ 2,640.00
Task Labor Total			$ 7,680.00
Task 3 - RA Implementaion			
Project Scientist	$ 115.00	24	$ 2,760.00
Specialist	$ 75.00	48	$ 3,600.00
Technician	$ 55.00	80	$ 4,400.00
Task Labor Total			$ 10,760.00
Task 4 -FER/CCR and SMP Development and Approval			
Project Scientist	$ 115.00	80	$ 9,200.00
Specialist	$ 80.00	140	$ 11,200.00
Surveyor	$ 87.00	60	$ 5,220.00
Technician	$ 55.00	200	$ 11,000.00
Task Labor Total			$ 36,620.00
Total Labor Costs			$ 57,460.00

Expenses and Subcontractor Costs[1]

Item	Unit Cost	Unit	#	Total Estimated Cost
Expenses				
Miscellaneous Expenses Incl. PPE	$ 500.00	Lump Sum	1	$ 500.00
Equipment Rental	$ 3,500.00	Lump Sum	1	$ 3,500.00
Total Expenses				$ 4,000.00
Subcontracted Services[1]				
Well Installation and Probe Injections	$ 14,000.00	Lump Sum	1	$ 14,000.00
Exc. Handling & Disp. Non-Haz Soils & UST Closure	$ 25,000.00	Lump Sum	1	$ 25,000.00
UST and Soils Removal Lab Fees VOCs	$ 90.00	Sample	20	$ 1,800.00
Post Remediaton Lab Fees VOCs	$ 90.00	Sample	50	$ 4,500.00
Remedial Agent Purchase and Shipping	$ 55,000.00	Lump Sum	1	$ 55,000.00
1 - Subcontracted Costs Include Max 5% Markup				
Total Subcontracted Services				$ 100,300.00
Total Expenses and Subcontractor Costs				$ 104,300.00

TOTAL ESTIMATED COST	**$ 161,760.00**
25% CONTINGENCY	**$ 40,440.00**
TOTAL ESTIMATED COST PLUS CONTINGENCY	**$ 202,200.00**

Lu Engineers
ENVIRONMENTAL • TRANSPORTATION • CIVIL

Table B - Former Labelon Site (NYSDEC # C835016), 10 Chapin Street Canandaigua, New York

Cost Estimate for Alternative #3, Impacted Soils Removal and In-Situ Soil and Groundwater Remediation to Unrestricted Standards

Lu Engineers 5/2/17

Professional	Rates	Hours	Labor Costs
Task 1 - AA Approval			
Project Scientist	$ 115.00	8	$ 920.00
Specialist	$ 80.00	32	$ 2,560.00
Technician	$ 55.00	24	$ 1,320.00
Task Labor Total			$ 4,800.00
Task 2 - RAWP Completion			
Project Scientist	$ 115.00	24	$ 2,760.00
Specialist	$ 80.00	64	$ 5,120.00
Technician	$ 55.00	60	$ 3,300.00
Task Labor Total			$ 11,180.00
Task 3 - RA Implementaion			
Project Scientist	$ 115.00	40	$ 4,600.00
Specialist	$ 75.00	80	$ 6,000.00
Technician	$ 55.00	96	$ 5,280.00
Task Labor Total			$ 15,880.00
Task 4 -FER/CCR and SMP Development and Approval			
Project Scientist	$ 115.00	88	$ 10,120.00
Specialist	$ 80.00	164	$ 13,120.00
Surveyor	$ 87.00	60	$ 5,220.00
Technician	$ 55.00	224	$ 12,320.00
Task Labor Total			$ 40,780.00
Total Labor Costs			$ 72,640.00

Expenses and Subcontractor Costs[1]

Item	Unit Cost	Unit	#	Total Estimated Cost
Expenses				
Miscellaneous Expenses Incl. PPE	$ 2,000.00	Lump Sum	1	$ 2,000.00
Equipment Rental	$ 10,000.00	Lump Sum	1	$ 10,000.00
Total Expenses				$ 12,000.00
Subcontracted Services[1]				
Well Installation and Probe Injections	$ 16,000.00	Lump Sum	1	$ 16,000.00
Exc. & Disp. Non-Haz Soils and UST Closure	$ 250,000.00	Lump Sum	1	$ 250,000.00
UST and Soils Removal Lab Fees VOCs	$ 90.00	Sample	12	$ 1,080.00
Post Remediaton Lab Fees VOCs	$ 90.00	Sample	25	$ 2,250.00
Remedial Agent Purchase and Shipping	$ 55,000.00	Lump Sum	1	$ 55,000.00
1 - Subcontracted Costs Include Max 5% Markup				
Total Subcontracted Services				$ 324,330.00
Total Expenses and Subcontractor Costs				$ 336,330.00

TOTAL ESTIMATED COST	**$ 408,970.00**
25% CONTINGENCY	**$ 102,242.50**
TOTAL ESTIMATED COST PLUS CONTINGENCY	**$ 511,212.50**

Lu Engineers
ENVIRONMENTAL • TRANSPORTATION • CIVIL