

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau E

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June 14, 2022

Transmitted Via E-mail ONLY

David Freeman
Main and Hertel LLC
1425 North University Avenue
Provo, UT 84604
dave@blackfishinvestments.com

Re: Main and Hertel
Site ID No. C915318
City of Buffalo, Erie County
Remedial Investigation / Interim Remedial
Measures / Alternatives Analysis Report &
Decision Document

Dear David Freeman:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the Remedial Investigation / Interim Remedial Measures / Alternatives Analysis Report (RIAAR) for the Main and Hertel site dated June 2022 and prepared by Benchmark Civil/Environmental Engineering & Geology, PLLC on behalf of the Main and Hertel LLC. The RIAAR is hereby approved. Please ensure that a copy of the approved RIAAR is placed in the document repository. The draft plan should be removed.

Attached is a copy of the Department's Decision Document for the site. The remedy is to be implemented in accordance with this Decision Document. Please ensure that a copy of the Decision Document is placed in the document repository.

Please contact the Department's Project Manager, Andrew Zwack, at (716) 851-7220 or andrew.zwack@dec.ny.gov at your earliest convenience to discuss next steps. Please recall the Department requires seven days notice prior to the start of field work.



Department of
Environmental
Conservation

Sincerely,

Michael J Cruden

Michael Cruden
Director
Remedial Bureau E
Division of Environmental Remediation

cc w/attachments:

Andrew Guglielmi - NYSDEC
Michael Cruden - NYSDEC
Stanley Radon - NYSDEC
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DECISION DOCUMENT

Main and Hertel
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915318
June 2022



Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - DECISION DOCUMENT

Main and Hertel
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915318
June 2022

Statement of Purpose and Basis

This document presents the remedy for the Main and Hertel site a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Main and Hertel site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy

efficiency as an element of construction.

2. 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 exceed the applicable soil cleanup objectives (SCOs). 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 for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

3. Enhanced Bioremediation / In-Situ Chemical Reduction

In-situ enhanced biodegradation will be employed to treat chlorinated volatile organic compounds in groundwater in an area upgradient of impacted wells. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the injection of a hydrogen release compound (HRC) to the subsurface. In-situ chemical reduction will be implemented to supplement the biodegradation of chlorinated volatile organic compounds in groundwater. Sulfidated zero-valent iron will also be injected into the subsurface to destroy chlorinated volatile organic compounds through direct contact and aid in creating a reducing environment further stimulating anaerobic degradation. The amendments will be added via injection wells installed from 7 to 17-feet and 22 to 28-feet below ground surface (bgs).

Monitoring will be required downgradient and within the treatment zone. Monitoring will be conducted for site related chlorinated VOCs and/or other parameters to assess the effectiveness of the treatments. Additional remedial actions may be required if monitoring shows that the remedy is not effective.

4. Vapor Mitigation

Any 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 groundwater.

5. 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, commercial, 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 Erie County DOH; and
- require compliance with the Department approved Site Management Plan.

6. 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 Remedial Element 5 above.

Engineering Controls: The soil cover discussed in Remedial Element 2 and the sub-slab depressurization system discussed in Remedial Element 4 above.

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;
 - descriptions of the provisions of the environmental easement including any land use and groundwater 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 Remedial Element 2, above, will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
 - 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 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 groundwater to assess the performance and effectiveness of the remedy; and
 - a schedule of monitoring and frequency of submittals to the Department.
 - 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 system(s). The plan includes, but is not limited to:
 - procedures for operating and maintaining the system(s); and
 - compliance inspection of the system(s) to ensure proper O&M as well as providing the data for any necessary reporting.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

6/14/2022

Michael J Cruden

Date

Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

Main and Hertel
Buffalo, Erie County
Site No. C915318
June 2022

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance, based on the reasonably anticipated use of the property.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repository:

DECInfo Locator - Web Application
<https://gisservices.dec.ny.gov/gis/dil/index.html?rs=C915318>

Frank E. Merriweather, Jr. Library
1324 Jefferson Avenue
Buffalo, NY 14208
Phone: 716-883-4418

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at <http://www.dec.ny.gov/chemical/61092.html>

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The 4.97-acres site is located on two tax parcels at 2239-2939 Main Street in the City of Buffalo. The site is located in a densely developed urban area at the intersection of Main Street and Hertel Avenue.

Site Features: The site slopes downward from the southeast to the northwest towards Main Street with little grade change in the central portion of the site. The site is occupied by two buildings with associated gravel site driveways and parking areas. The southeastern quarter of the site consists of an undeveloped wooded area. A former rail spur is evident that runs across the site from the southeast to the northwest.

Current Zoning and Land Use: The site is currently vacant and is zoned as "mixed-use core" by the City of Buffalo. Surrounding properties are a mix of commercial use and single-family or multi-family residential. The planned use is student housing with ancillary commercial and retail uses. Residential properties are directly adjacent to the site along the southeastern and southwestern borders of the site in addition to residential properties located approximately 115-feet across Main Street.

Past Use of the Site: The subject property was most recently used for metal electroplating operations from at least 1970 to 2018. In addition to electroplating operations the site has been used for various manufacturing operations since at least 1910 and include auto/truck manufacturing, gasoline pump manufacturing, cereal manufacturing, dairy equipment manufacturing, paint manufacturing, and auto repair.

Site Geology and Hydrogeology: In general, the area can best be described as highly disturbed. Most of the property contains fill material which includes silty gravelly soil, concrete, and brick. Where present, native soil consists of silty sandy clay. Bedrock ranges from 1.8-feet below ground surface (bgs) to 12-feet bgs.

Groundwater was not encountered in overburden soils. Groundwater occurs in the Onondaga Limestone bedrock at depths ranging between approximately 3 feet and 22 feet below ground surface (bgs). Groundwater flow is to the northwest towards Main Street. The Niagara Frontier Transportation Authority (NFTA) Metro Rail subway, constructed in the late 1980s, runs beneath Main Street and appears to heavily influence bedrock groundwater. There is an approximate 20-

foot gradient from the center of the site towards the site boundary along Main Street as compared to a 4-foot gradient from the rear of the site towards the center.

A site location map and site plan are attached as Figures 1 and 2 respectively.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to restricted-residential use (which allows for commercial use and industrial use) as described in Part 375-1.8(g) were/was evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The Volunteer(s) does/do not have an obligation to address off-site contamination. The Department has determined that this site poses a significant threat to human health and the environment and there are off-site impacts that require remedial activities; accordingly, enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. For a full listing of all SCGs see: <http://www.dec.ny.gov/regulations/61794.html>

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized below. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

arsenic	1,1-dichloroethane
cadmium	cis-1,2-dichloroethene
lead	trans-1,2-dichloroethene
benzo(a)anthracene	trichloroethene (TCE)
benzo(a)pyrene	vinyl chloride
benzo(b)fluoranthene	benzo(k)fluoranthene
chrysene	polychlorinated biphenyls (PCB)
dibenz[a,h]anthracene	mercury
indeno(1,2,3-cd)pyrene	

The contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor intrusion

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Decision Document.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

Interim Remedial Measures

IRMs were completed in conformance with a Department approved work plan. The IRMs consisted of:

- Decommissioning and off-site disposal of three transformers containing polychlorinated biphenyls (PCBs) dielectric fluids (15,680 pounds);
- Demolition of Building 3 and a former oil pump house resulting in off-site disposal of light fixture ballasts and bulbs (498 pounds), characteristic hazardous waste lead impacted paint/wood (412 tons), characteristic hazardous waste for cadmium impacted concrete (50 tons), Toxic Control Substance Act (TSCA) regulated PCB impacted concrete (30.6 tons), and asbestos containing material (ACM). Additional general C&D debris was disposed of off-site at a permitted landfill or recycled off-site at a facility registered with the Department; and
- Excavation and off-site disposal of soil exceeding the site-specific action limits (SSALs) of 30 parts per million (ppm) for arsenic and 500 ppm for total polycyclic aromatic hydrocarbons (PAHs). During excavation activity eight small underground storage tanks (USTs) were identified within the former Building 3 footprint in addition to multiple deteriorated drum carcasses in another excavation area. Approximately 1,715-tons of soil was excavated and disposed off-site. The UST contents were removed and containerized, resulting in two 55-gallon drums of material characteristically hazardous for lead and nine 55-gallon drums of non-hazardous waste being sent for off-site disposal. 5,500-pounds of drum carcasses were recycled off-site.

The IRMs are detailed in a Construction Completion report submitted concurrent with the Remedial Investigation and Alternatives Analysis Report dated June 2022.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

During a Phase II Environmental Site Assessment and the RI, analytical samples were collected from soil, groundwater, soil vapor, sub-slab soil vapor, indoor air, and outdoor air. Soil and groundwater were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, PCBs, pesticides, and per- and polyfluoroalkyl substances (PFAS).

Soil vapor, sub-slab soil vapor, indoor air, and outdoor air were analyzed for VOCs. Based upon investigations conducted to date, the primary Contaminants of Concern (COCs) are chlorinated VOCs in groundwater, soil vapor, and indoor air, and metals and SVOCs in soil.

Surface Soil: A total of eight samples were collected from 0 to 2-inches below the vegetated surface and analyzed for SVOCs, metals, PCBs, and pesticides. Exceedances of Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs) for metals and SVOCs, specifically PAHs, were identified. The following metals were detected in at least one location exceeding RRSCOs:

- cadmium at 6.22 parts per million (ppm); RRSCO 4.3 ppm
- mercury at 8.25 ppm; RRSCO 0.81 ppm

The following PAHs were detected in at least one location exceeding RRSCOs:

- benzo(a)anthracene up to 29.8 ppm; RRSCO 1 ppm
- benzo(a)pyrene up to 25.2 ppm; RRSCO 1 ppm
- benzo(b)fluoranthene up to 27.8 ppm; RRSCO 1 ppm
- benzo(k)fluoranthene at 19.4 ppm; RRSCO 3.9 ppm
- chrysene at 31.1 ppm; RRSCO 3.9 ppm
- dibenz(a,h)anthracene up to 5.34 ppm; RRSCO 0.33 ppm
- indeno(1,2,3-cd)pyrene up to 15.7 ppm; RRSCO 0.5 ppm

The pesticide dieldrin was detected in one location at 0.757 ppm exceeding the RRSCO of 0.2 ppm. PCBs were not detected exceeding RRSCOs.

Investigation results do not indicate that site contaminants in surface soil have migrated off-site.

Subsurface Soil: A total of twenty samples were collected over depths ranging from 0 to 10-feet bgs. All samples were analyzed for SVOCs with eighteen samples analyzed for VOCs, metals, PCBs, and pesticides and two samples analyzed for PFAS. No VOCs, PCBs, or pesticides were detected exceeding RRSCOs. Neither the PFAS perfluorooctanoic acid (PFOA) or perfluorooctanesulfonic acid (PFOS) were detected above their restricted residential guidance values.

The following metals were detected in at least one location exceeding RRSCOs:

- arsenic up to 27.2 ppm; RRSCO 16 ppm-
- cadmium up to 11.6 ppm; RRSCO 4.3 ppm-
- lead up to 588 ppm; RRSCO 400 ppm-

Barium, chromium, copper, and nickel were detected above RRSCOs, however these exceedances were not widespread.

The following PAHs were detected in at least one location exceeding RRSCOs:

- benzo(a)anthracene up to 13.8 ppm; RRSCO 1 ppm
- benzo(a)pyrene up to 10.9 ppm; RRSCO 1 ppm
- benzo(b)fluoranthene up to 13.4 ppm; RRSCO 1 ppm
- benzo(k)fluoranthene at 5.84 ppm; RRSCO 3.9 ppm

- chrysene up to 12.1 ppm; RRSCO 3.9 ppm
- dibenz(a,h)anthracene up to 2.25 ppm; RRSCO 0.33 ppm
- indeno(1,2,3-cd)pyrene up to 6.43 ppm; RRSCO 0.5 ppm

Investigation results do not indicate that site contaminants in subsurface soil have migrated off-site.

Groundwater: samples were collected from six on-site bedrock monitoring wells installed at depths ranging from 11 to 28.5-feet. Samples were analyzed for VOCs, SVOCs, metals, PCBs, pesticides, and PFAS. No SVOCs, metals, PCBs, or pesticides were detected above groundwater quality standards (GWQS).

The following VOCs were detected in at least one monitoring well exceeding GWQS:

- 1,1-dichloroethane up to 11 parts per billion (ppb); GWQS 0.6 ppb
- 1,1-dichloroethene at 15 ppb; GWQS 5 ppb
- cis-1,2-dichloroethene up to 1,100 ppb; GWQS 5 ppb
- trans-1,2-dichloroethene at 140 ppb; GWQS 5 ppb
- 1,1,1-trichloroethane at 30 ppb; GWQS 5 ppb
- trichloroethene up to 220 ppb; GWQS 5 ppb
- vinyl chloride up to 100 ppb; GWQS 2 ppb
- benzene up to 1.4 ppb; GWQS 1 ppb
- 1,2,4-trimethylbenzene at 14 ppb; GWQS 5 ppb
- m,p-xylene at 101 ppb; GWQS 5 ppb
- o-xylene at 15.7 ppb; GWQS 5 ppb

The following PFAS were detected in three of the four monitoring wells sampled exceeding guidance values:

- PFOA up to 34.3 parts per trillion (ppt), guidance value 10 ppt
- PFOS up to 62.9 ppt, guidance value 10 ppt

PFAS were detected in the downgradient wells, however groundwater is not used as a source of drinking water in this area.

Two additional groundwater monitoring wells were installed off-site on the opposite side of Main Street and sampled for VOCs. Trichloroethene and cis-1,2-dichloroethene were the only VOCs detected in both wells. Trichloroethene exceeded GWQS in one off-site well at 5.8 ppb (GWQS 5 ppb). It is anticipated that the Metro Rail tunnel intercepts some or all of the bedrock groundwater flow from the site. Collected bedrock groundwater is discharged to the Buffalo Sewer Authority (BSA) for treatment.

Chlorinated VOCs were detected exceeding GWQS in monitoring wells in the central portion of the site, downgradient wells at the site border, and one of the off-site wells. Investigation results indicate that chlorinated VOCs have historically migrated off-site in groundwater and migration may be continuing into or beyond the NFTA Metro Rail tunnel in bedrock groundwater.

Petroleum related VOCs were detected exceeding GWQS in two monitoring wells, one upgradient in the southeast corner of the site and one in the central portion of the site. Petroleum related VOCs are not detected in the downgradient wells at the northwest border along Main Street or in the off-site wells. Investigation results indicate that petroleum related VOCs are not migrating off-site in groundwater.

Soil Vapor, Indoor Air and Outdoor Air: sub-slab vapor and indoor air samples from Building 2 and an outdoor air sample were collected and analyzed for VOCs. Trichloroethene was detected in all sub-slab soil vapor samples ranging in concentration from 8.1 micrograms per cubic meter (mcg/m³) to 63 mcg/m³. Trichloroethene was detected in all four indoor air samples ranging from 0.97 mcg/m³ to 1.4 mcg/m³. Trichloroethene was detected at low levels in the outdoor sample at concentrations of 0.32 mcg/m³. Based on the NYSDOH guidance document titled 'Guidance for Evaluating Soil Vapor Intrusion in the State of New York' dated October 2006 with subsequent revisions, three of the sampling locations required actions needed to address potential exposure. Additional VOCs were detected but were not at concentrations that require further action.

An additional five soil vapor probes were installed immediately above bedrock at depths up to 6-feet at locations along the perimeter of the site. Samples were collected to assess the potential for off-site migration. Site related VOCs were detected at multiple soil vapor sampling locations however there are currently no standards for soil vapor.

Investigation results indicate that site contaminants in soil vapor have the potential to migrate off-site.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

The site is completely fenced, which restricts public access. However, persons entering the site could contact contaminants in the soil by walking on the site, digging or otherwise disturbing the soil. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. However, the potential exists for inhalation of contaminants in indoor air in future occupied structures. The potential for soil vapor impacts in off-site buildings is currently being evaluated.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

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 ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4: Restricted use with site-specific soil cleanup objectives remedy.

The selected remedy is referred to as the Track 4 Cover System and In-situ Groundwater Treatment remedy.

The elements of the selected remedy, as shown in Figure 3, 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;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. 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 exceed the applicable soil cleanup objectives (SCOs). 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 for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

3. Enhanced Bioremediation / In-Situ Chemical Reduction

In-situ enhanced biodegradation will be employed to treat chlorinated volatile organic compounds in groundwater in an area upgradient of impacted wells. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by the injection of a hydrogen release compound (HRC) to the subsurface. In-situ chemical reduction will be implemented to supplement the biodegradation of chlorinated volatile organic compounds in groundwater. Sulfidated zero-valent iron will also be injected into the subsurface to destroy chlorinated volatile organic compounds through direct contact and aid in creating a reducing environment further stimulating anaerobic degradation. The amendments will be added via injection wells installed from 7 to 17-feet and 22 to 28-feet below ground surface (bgs).

Monitoring will be required downgradient and within the treatment zone. Monitoring will be conducted for site related chlorinated VOCs and/or other parameters to assess the effectiveness of the treatments. Additional remedial actions may be required if monitoring shows that the remedy is not effective.

4. Vapor Mitigation

Any 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 groundwater.

5. 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, commercial, 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 Erie County DOH; and
- require compliance with the Department approved Site Management Plan.

6. 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 Remedial Element 5 above.

Engineering Controls: The soil cover discussed in Remedial Element 2 and the sub-slab depressurization system discussed in Remedial Element 4 above.

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;
- descriptions of the provisions of the environmental easement including any land use and groundwater 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 Remedial Element 2, above, will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
- 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 engineering controls.

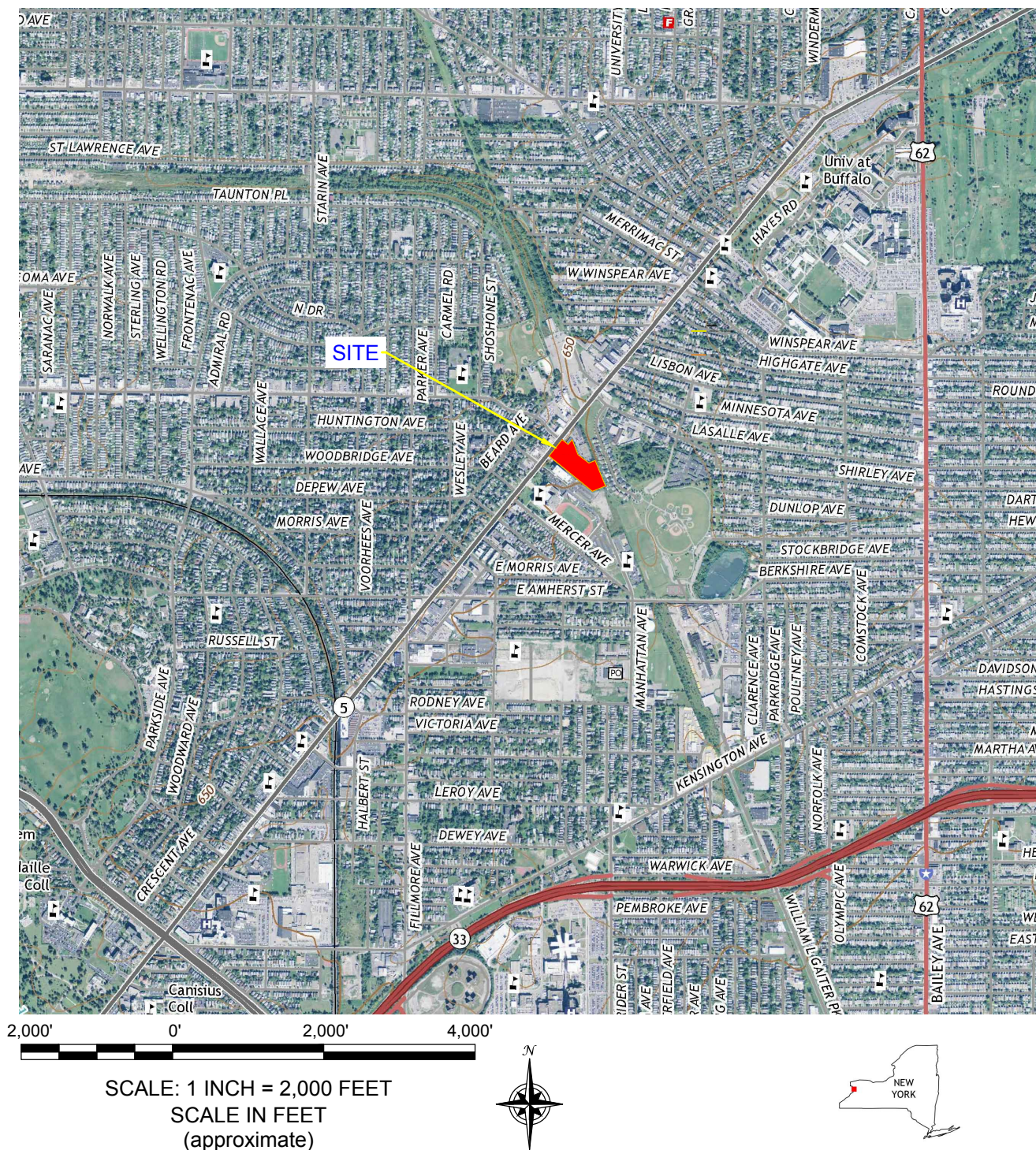
b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy; and
- a schedule of monitoring and frequency of submittals to the Department.

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 system(s). The plan includes, but is not limited to:

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

FIGURE 1



2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599



PROJECT NO.: 0463-018-001

DATE: OCTOBER 2019

DRAFTED BY: CMC

SITE LOCATION AND VICINITY MAP

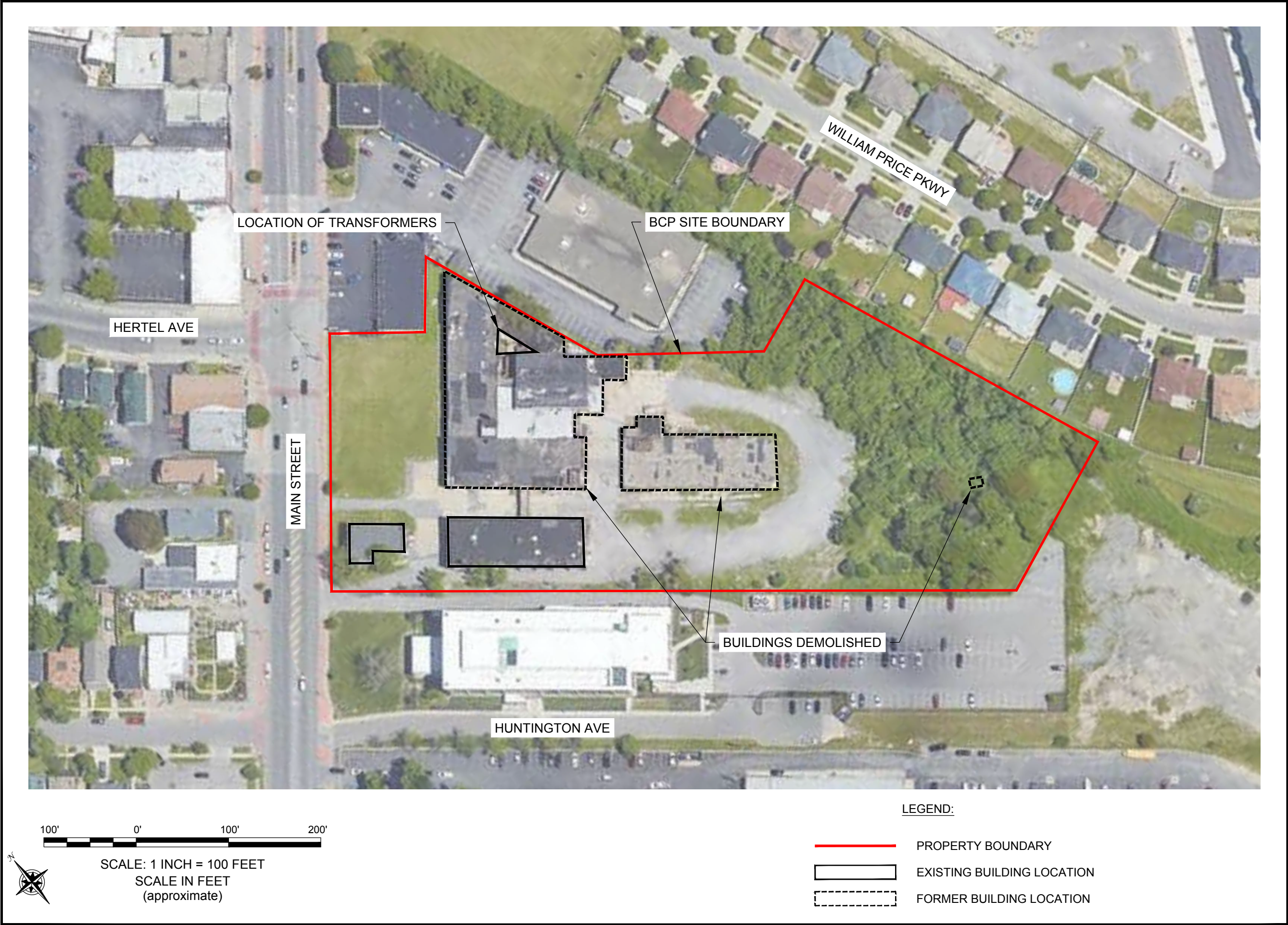
REMEDIAL ACTION WORK PLAN

MAIN AND HERTEL SITE
BCP SITE NO. C915318
BUFFALO, NEW YORK

PREPARED FOR

MAIN AND HERTEL, LLC

DISCLAIMER: PROPERTY OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC. & TURNKEY ENVIRONMENTAL RESTORATION, LLC. **IMPORTANT:** THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC & TURNKEY ENVIRONMENTAL RESTORATION, LLC.



SITE PLAN (AERIAL)

REMEDIAL ACTION WORK PLAN
MAIN AND HERTEL SITE
BCP SITE NO. C915318
BUFFALO, NEW YORK
PREPARED FOR
MAIN AND HERTEL, LLC

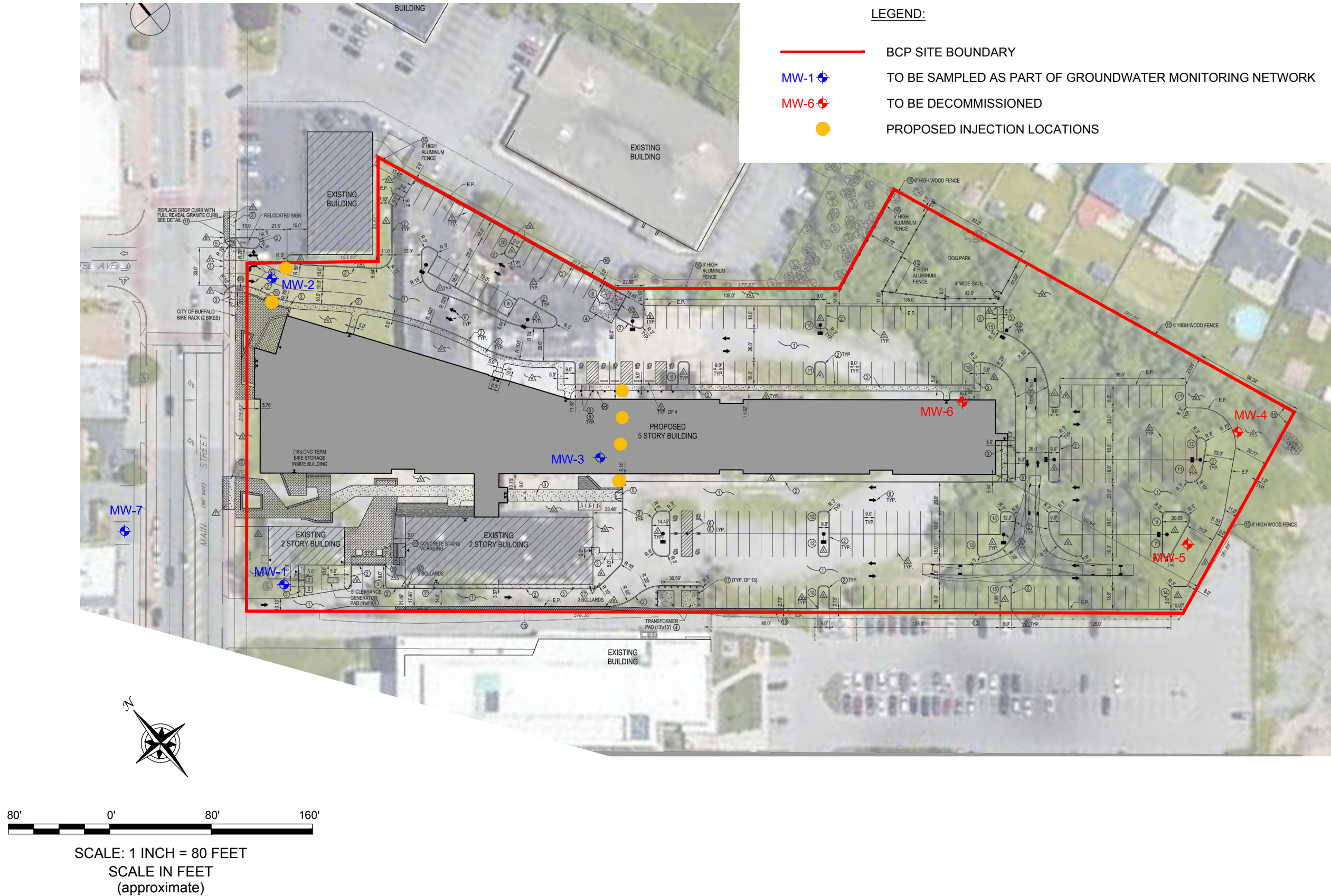


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FIGURE 2

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GROUNDWATER INJECTION AREAS & GROUNDWATER SAMPLING LOCATIONS COMPARED TO PROPOSED DEVELOPMENT PLAN

REMEDIAL ACTION WORK PLAN

2929 MAIN STREET SITE
BCP SITE NO. C915318
BUFFALO, NEW YORK
PREPARED FOR
MAIN AND HERTEL LLC



2558 HAMBURG TURNPIKE, SUITE 300, BUFFALO, NY 14218, (716) 856-0599

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FIGURE 3

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