DECISION DOCUMENT

275 Franklin Street
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915208
September 2013

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

DECLARATION STATEMENT - DECISION DOCUMENT

275 Franklin Street
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915208
September 2013

Statement of Purpose and Basis

This document presents the remedy for the 275 Franklin Street 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 275 Franklin Street 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, maintenance, and monitoring of the remediation 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 gas 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. SITE COVER
A site cover currently exists (asphalt) and will be maintained to allow for continued commercial

use of the site until future redevelopment plans are implemented. Because the multi-use zoning district allows restricted residential use, any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required, it will be a minimum of two foot, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

3. ENHANCED SHALLOW GROUNDWATER BIOREMEDIATION

In-situ shallow groundwater treatment of the highest residual VOC contaminated shallow groundwater in the immediate vicinity of MW-5 (residual source area) through enhanced natural attenuation of chlorinated VOCs (PCE and its breakdown products) is proposed for site C915208 residual source only. The current post IRM shallow groundwater plume area is depicted in Figure 3. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by a combination of microbial inoculation and injecting a hydrogen release compound (molasses) into the subsurface to promote dechlorinating microbe growth. The microbial reductive dechlorination process will also be enhanced with the injection of micron scale zero valent iron (ZVI). The treatment materials will be injected into the shallow groundwater source area via injection probes at a depth ranging from 10 to 20 feet. The source treatment injection area is depicted on Figure 5. The injection materials may be supplemented with additional buffers and nutrients that will be determined during the remedial design.

Although there is residual chlorinated VOC contamination in the deep groundwater zone, no measures to address this residual chlorinated VOC contamination in the deep groundwater zone are proposed.

4. PLUME REDUCTION

Plume reduction will be accomplished by treating the groundwater for chlorinated VOCs via in-situ treatment methods such that the groundwater leaving the site has been effectively treated to water quality criteria.

At this site, the shallow chlorinated VOC contaminant plume has migrated onto an adjoining property at 267 Franklin Street which is part of the adjoining BCP project site C915237 (432 Pearl Street Site). The current post C915208 IRM shallow groundwater plume area is depicted in Figure 3. Though there is residual chlorinated VOC contamination in the deep groundwater zone at both BCP sites C915208 and C915237 (see Figure 4), no measures to address this residual chlorinated VOC contamination in the deep groundwater zone is proposed. Contaminant plume reduction will be accomplished by injecting in-situ treatment materials along a series of injection points 10 to 20 feet in depth along an accessible western perimeter area of the site forming a vertical permeable reactive treatment zone (see Figure 5). This vertical permeable reactive treatment zone will continue southward along the accessible western and southern perimeter areas of adjoining BCP site C915237 (267 Franklin Street parcel) (see Figure 5 for the continuation of the plume reduction remedy). The in-situ treatment materials will

utilize the same materials used in the source area treatment system to promote enhanced natural attenuation of residual chlorinated VOC contamination in the shallow groundwater zone. No remediation measures are proposed to address off-site migration of residual chlorinated VOC contamination in the deep groundwater zone.

5. INSTITUTIONAL CONTROL

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

- requires 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);
- allows the use and development of the controlled property for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires 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: (ICs) discussed in Paragraph 5.

   Engineering Controls: The site cover discussed in Paragraph 2 above, enhanced shallow groundwater bioremediation discussed in Paragraph 3 above, and plume reduction as discussed Paragraph 4 above.

   This plan includes, but may not be limited to:

   i. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
   ii. a Monitoring Plan to ensure groundwater quality and to assess the performance and effectiveness of the site cover;
   iii. descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
   iv. provisions for evaluation of the potential for soil vapor intrusion into any new buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   v. provisions for the management and inspection of the identified engineering controls;
   vi. maintaining site access controls and Department notification; and
   vii. 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:

   i. monitoring of groundwater to assess the performance and effectiveness of the

remedy;

ii. a schedule of monitoring and frequency of submittals to the Department; and
iii. monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required pursuant to item a.iv. above.

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.

_____	_____
Date	Michael Cruden, Director Remedial Bureau E

DECISION DOCUMENT

275 Franklin Street
Buffalo, Erie County
Site No. C915208
September 2013

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, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

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:

Buffalo & Erie County Public Library
Attn: Michael Mahaney
1 LaFayette Square
Buffalo, NY 14203
Phone: 716-858-8900

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, Voluntary 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 brownfield site encompasses two contiguous parcels in the City of Buffalo, Erie County, and are identified as 275-277 Franklin Street (~0.13 acres), and 279 Franklin Street (~0.12 acres). The site is situated in an urban commercial district.

SITE FEATURES: The site is paved with asphalt and is currently used as a commercial surface parking lot approximately 0.25 acres in size.

CURRENT ZONING/USE: Both contiguous parcels that constitute the site are situated in the Downtown Opportunity (DO) zoning district which currently contains a mix of uses including apartment residences, restaurants, retail, entertainment, office and parking. Permitted use in the DO zoning district includes residential, office, (limited) retail, restaurant, hotel and entertainment. The surrounding parcels are currently used for a combination of commercial uses including surface parking, restaurant and entertainment.

PAST USE OF THE SITE: Record information concerning the use of both parcels dates back to the late 1800s where the area was predominantly closely spaced urban residential interspersed with commercial businesses and establishments.

279 Franklin Street: This lot was used for residential purposes from the late 1800s through the 1950s, and as a parking lot from the early 1980s to present. Previous use of the lot does not reveal any recognized environmental concerns.

275-277 Franklin Street: In the late 1800s, the lot contained a residence with a carriage shed facing Asbury Alley. By the 1950s, the residence was replaced with a commercial use building, and record information indicates that the structure was used by a dry cleaning business from approximately 1951 through the early 2000s. This parcel became delinquent in property taxes and the City of Buffalo foreclosed on the parcel for back taxes. The parcel was sold by the City in 2004. The building on the parcel was demolished in 2004 by the applicant. The building area of the parcel was subsequently paved over and is currently being used as a commercial surface parking lot.

According to the BCP application, future development plans for the site and adjoining BCP site (C915237) consists of a hotel with conference and parking facilities.

SITE GEOLOGY/HYDROGEOLOGY:
Overburden: The site is located within the Erie-Ontario lake plain physiographic province, which is typified by little topographic relief and gentle slope toward Lake Erie, except in the

immediate vicinity of major drainage ways. The surficial geology of the Lake Erie plain generally consists of a thin glacial till layer, glaciolacustrine (lake-laid laminated silts and clays) deposits, alluvium, and soils derived by these deposits. Glacial till deposits were not encountered at the site except for a thin layer (1 to 2 feet thick) above limestone bedrock. The site geology consists of a lake-laid sandy ridge deposit about 40 to 45 feet thick with several inter-bedded silty clay lenses. The site is also covered by a thin soil/fill layer about 2 to 5 feet thick and is found throughout the site. The fill is characteristic of urban fill common in the City of Buffalo.

Bedrock: The site is situated over the Onondaga formation limestone. Limestone bedrock was encountered about 52 feet below the surface.

Hydrogeology: Unconfined shallow groundwater was encountered within the native soils at depths of approximately 10 to 12 feet below ground surface. Because of a silty clay soil lens within the sandy soil profile at a depth of approximately 25 to 30 feet below ground surface, the site has a defined shallow and deep groundwater zone. Site groundwater flow gradient (shallow and deep) appears to flow in a south/southwest direction. Regional groundwater appears to flow west/southwest toward Lake Erie and confluence of the Buffalo River.

A site location map is attached as Figure 1.

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:

- groundwater
- soil
- soil 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:

TETRACHLOROETHYLENE (PCE) TRICHLOROETHENE (TCE)

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.

IRM (Onsite) - HRC Injection/Soil Vapor Extraction

IRM (On-site) - HRC Injection

An IRM for the site consisting of in-situ enhanced bioremediation groundwater treatment and soil vapor extraction (SVE) was implemented in 2008. The in-situ groundwater treatment involved injecting a hydrogen reducing compound (HRC - an augmented molasses type food product) into the contaminated shallow groundwater zone at numerous intervals to help propagate anaerobic dechlorinating bacteria with the ability to consume and breakdown chlorinated VOCs. The HRC injection was completed in August 2008.

IRM (On-site) – Soil Vapor Extraction

A soil vapor extraction (SVE) system was also implemented in 2008 to extract chlorinated VOCs bound to vadose zone soils in the chlorinated VOC source area. The SVE system consisted of a series of soil vapor extraction wells installed in vadose zone soils in the chlorinated VOC contaminated source area. The vapor extraction wells were coupled to a vacuum blower system to extract the solvent vapors from the soil. The solvent vapors were scrubbed from the extracted vadose zone air using activated carbon. Installation of the SVE system was completed in December 2008 and was operated through September 2009 where subsequent confirmation soil sampling indicated that target VOC reduction levels (commercial SCGs) in vadose zone soils were exceeded (restricted residential SCGs were achieved). Based upon exhaust air monitoring, an estimate of more than 575 pounds of VOC contaminant mass was extracted from the soil source area.

Post-IRM shallow groundwater sampling indicates a general reduction in dissolved VOC levels; however, some rebound has occurred and additional measures are considered necessary. See

Figure 3 for a depiction of the current shallow contaminant plume and Figure 4 for deep groundwater contamination data.

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.

PRE-REMEDIATION: An RI commenced in late 2006 to supplement earlier environmental site assessment in 2004. Results from this work revealed chlorinated solvents commonly used by dry cleaners (tetrachloroethene [PCE]) in soils up to 20,000 microgram/kilogram (ug/kg) PCE and in shallow groundwater up to 19 parts per million (ppm) PCE at 275-277 Franklin St parcel. The water quality standard for PCE is 0.005 ppm. The source area in shallow groundwater contamination appears to be centered around MW-5. The RI investigation included an adjoining lot at 267 Franklin Street (Site C915237) currently owned by the applicant revealed chlorinated solvents in shallow groundwater at levels up to 18 ppm for PCE. A supplemental site investigation was conducted in 2008 to develop an IRM for the site. Because of a silty clay soil lens midway between the surface and bedrock, two distinct groundwater zones exist at the site. The silty clay soil lens has limited some downward migration of the dissolved contamination. However, the 2008 supplemental investigation confirmed that deeper groundwater zone is contaminated with the chlorinated solvents, with one monitoring well containing 9.4 ppm PCE. PCE levels at this monitoring point have dropped to 0.091 ppm PCE during the 2012 sampling event (post IRM – see below). The supplemental investigation confirmed that the bedrock zone does not appear to be contaminated with the chlorinated solvents.

Chlorinated solvent vapors were detected during soil vapor evaluations at the 279 Franklin Street parcel.

Investigation of off-site areas by the Department on adjoining properties revealed an extensive elongated off-site chlorinated VOC plume in shallow groundwater. The off site impacts to deep groundwater zone were limited to one of the off-site sampling points hydraulically downgradient of the BCP site (south of the BCP site). Dissolved levels of PCE and its breakdown products at this off-site deep groundwater well have been found at 0.101 ppm total VOCs.

POST-IRM: An IRM was implemented in 2008 on the site to address VOC contamination in vadose zone soils and in the shallow groundwater zone. The vapor extraction system appeared to have effectively addressed vadose zone contamination in the soil column above the groundwater source plume. However PCE at shallow well MW-5 rebounded to 70 ppm based upon sampling in 2012. Additional measures to remediate chlorinated VOC contamination in shallow and deep groundwater zones are necessary. An additional investigative boring and deep monitoring well to further assess deep groundwater impacts was installed in 2012 at 267 Franklin Street (adjoining BCP site C915237). Deep groundwater sampling confirmed dissolved chlorinated VOC contamination at levels up to 0.069 ppm total VOCs at this new deep well.

The SVE system reduced the chlorinated VOCs in the vadose (soil) zone in the source area to restricted residential SCG guidance levels.

Because of the extent of the dissolved shallow plume, vapor intrusion (VI) from the chlorinated solvents was a concern with offsite neighboring structures. A soil VI evaluation completed by the Department in 2008 revealed PCE impacts to indoor air quality inside the 267 Franklin Street apartment building. The Department subsequently installed a sub-slab depressurization system (SSDS) inside the apartment building to address VI and reduce indoor air concentrations of PCE. This building and parcel were subsequently acquired by the applicant and allowed into the BCP as site C915237. Vapor intrusion was confirmed in another off-site building and an SSDS was installed in 2012.

Additional investigations were required to assess off-site impacts, health and safety concerns, the presence of DNAPL, and bedrock aquifer contamination. The Department monitoring has confirmed an elongated PCE plume has migrated in a southwesterly direction across Franklin Street.

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*.

Access to the site is unrestricted. However, contact with contaminated soil or groundwater is unlikely unless people dig below the ground surface. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source 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 the 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. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy.

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.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

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.

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 Shallow Groundwater Remediation remedy.

The elements of the selected remedy, as shown in Figure 2, are as follows:

1. REMEDIAL DESIGN

A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remediation 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 gas 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. SITE COVER

A site cover currently exists (asphalt) and will be maintained to allow for continued commercial use of the site until future redevelopment plans are implemented. Because the multi-use zoning district allows restricted residential use, any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required, it will be a minimum of two foot, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

3. ENHANCED SHALLOW GROUNDWATER BIOREMEDIATION

In-situ shallow groundwater treatment of the highest residual VOC contaminated shallow groundwater in the immediate vicinity of MW-5 (residual source area) through enhanced natural attenuation of chlorinated VOCs (PCE and its breakdown products) is proposed for site C915208 residual source only. The current post IRM shallow groundwater plume area is depicted in Figure 3. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by a combination of microbial inoculation and injecting a hydrogen release compound (molasses) into the subsurface to promote dechlorinating microbe growth. The microbial reductive dechlorination process will also be enhanced with the injection of micron scale zero valent iron (ZVI). The treatment materials will be injected into the shallow groundwater source area via injection probes at a depth ranging from 10 to 20 feet. The source treatment injection area is depicted on Figure 5. The injection materials may be supplemented with additional buffers and nutrients that will be determined during the remedial design.

Although there is residual chlorinated VOC contamination in the deep groundwater zone, no measures to address this residual chlorinated VOC contamination in the deep groundwater zone are proposed.

4. PLUME REDUCTION

Plume reduction will be accomplished by treating the groundwater for chlorinated VOCs via in-situ treatment methods such that the groundwater leaving the site has been effectively treated to water quality criteria.

At this site, the shallow chlorinated VOC contaminant plume has migrated onto an adjoining property at 267 Franklin Street which is part of the adjoining BCP project site C915237 (432 Pearl Street Site). The current post C915208 IRM shallow groundwater plume area is depicted in Figure 3. Though there is residual chlorinated VOC contamination in the deep groundwater zone at both BCP sites C915208 and C915237 (see Figure 4), no measures to address this residual chlorinated VOC contamination in the deep groundwater zone is proposed. Contaminant plume reduction will be accomplished by injecting in-situ treatment materials along a series of injection points 10 to 20 feet in depth along an accessible western perimeter area of the site forming a vertical permeable reactive treatment zone (see Figure 5). This vertical permeable reactive treatment zone will continue southward along the accessible western and southern perimeter areas of adjoining BCP site C915237 (267 Franklin Street parcel) (see Figure 5 for the continuation of the plume reduction remedy). The in-situ treatment materials will utilize the same materials used in the source area treatment system to promote enhanced natural attenuation of residual chlorinated VOC contamination in the shallow groundwater zone. No remediation measures are proposed to address off-site migration of residual chlorinated VOC contamination in the deep groundwater zone.

5. INSTITUTIONAL CONTROL

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

- requires 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);
- allows the use and development of the controlled property for restricted residential, commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires 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: (ICs) discussed in Paragraph 5.

   Engineering Controls: The site cover discussed in Paragraph 2 above, enhanced shallow groundwater bioremediation discussed in Paragraph 3 above, and plume reduction as discussed Paragraph 4 above.

This plan includes, but may not be limited to:

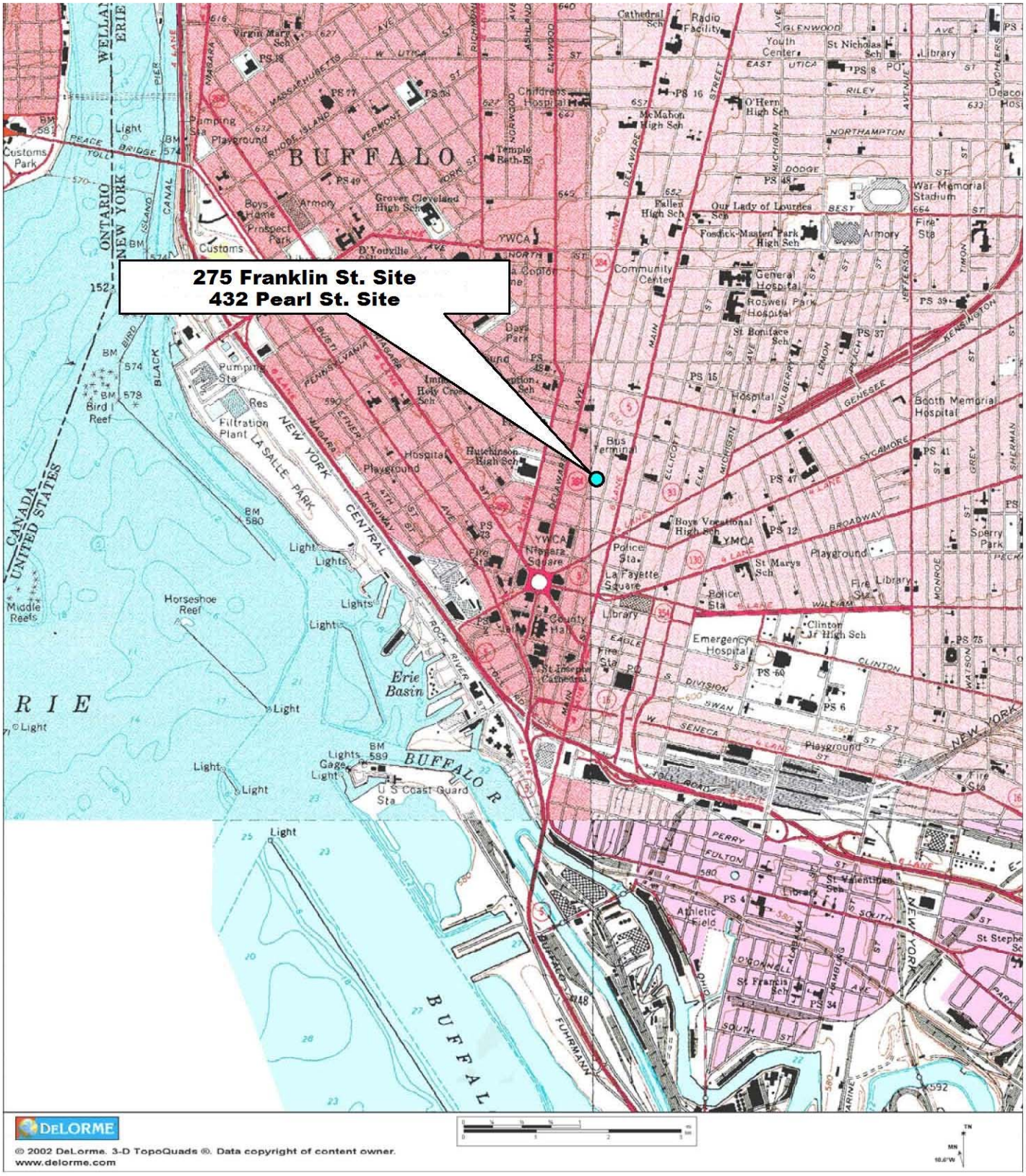
i. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

ii. a Monitoring Plan to ensure groundwater quality and to assess the performance and effectiveness of the site cover;

iii. descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
iv. provisions for evaluation of the potential for soil vapor intrusion into any new buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
v. provisions for the management and inspection of the identified engineering controls;
vi. maintaining site access controls and Department notification; and
vii. 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:
   i. monitoring of groundwater to assess the performance and effectiveness of the remedy;
   ii. a schedule of monitoring and frequency of submittals to the Department; and
   iii. monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required pursuant to item a.iv. above.

FIGURE 1



BENCHMARK
ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: 0156-001-102

DATE: APRIL 2010

DRAFTED BY: BCH

SITE LOCATION AND VICINITY MAP

RI-AA-IRM REPORT
432 PEARL STREET SITE
275 FRANKLIN STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BUFFALO DEVELOPMENT CORPORATION

275-279 Franklin St. Site - DEC BCP Site C915208

432 Pearl Street Site - DEC BCP Site C915237

City of Buffalo, Erie Co.

FIGURE - 2

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE SUITE 300 BUFFALO, NY 14218 (716) 856-0599

JOB NO.: 0156-001-102

POST-IRM TOTAL cVOCs IN SHALLOW GROUNDWATER ISOCONCENTRATION MAP - JUNE 2012

RI-AA-IRM REPORT

275 FRANKLIN STREET SITE
BCP NO. C915208
BUFFALO, NEW YORK

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Figure 3

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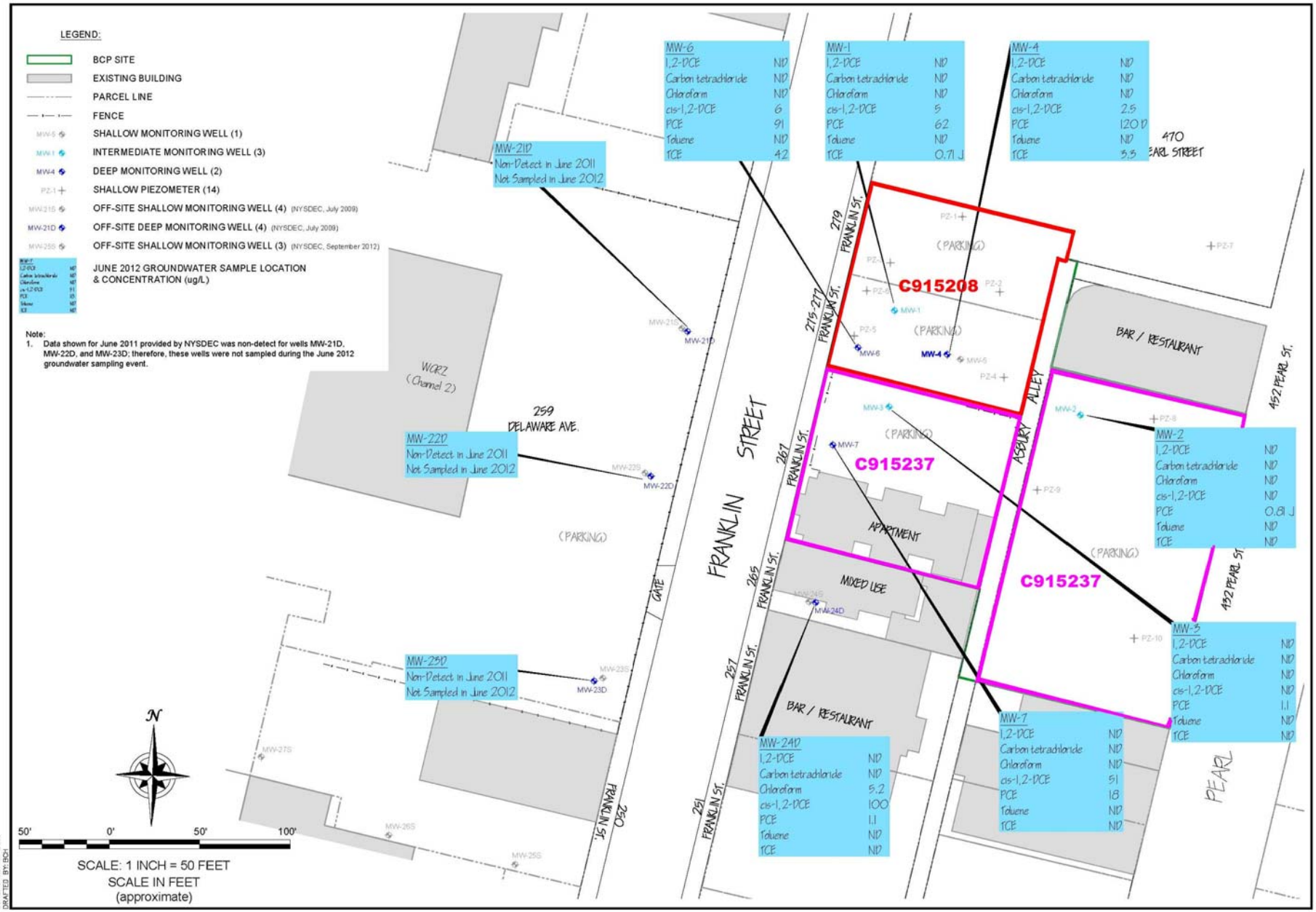
F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\RI-AA-IRM Report (Jan 2013)\Figure 16, Post-IRM Total cVOCs in Shallow GW Isoconcentration Map (Jan 2013).dwg



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VOCs IN INTERMEDIATE & DEEP GROUNDWATER

RI-AA-IRM REPORT

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2558 HAMBURG TURNPIKE
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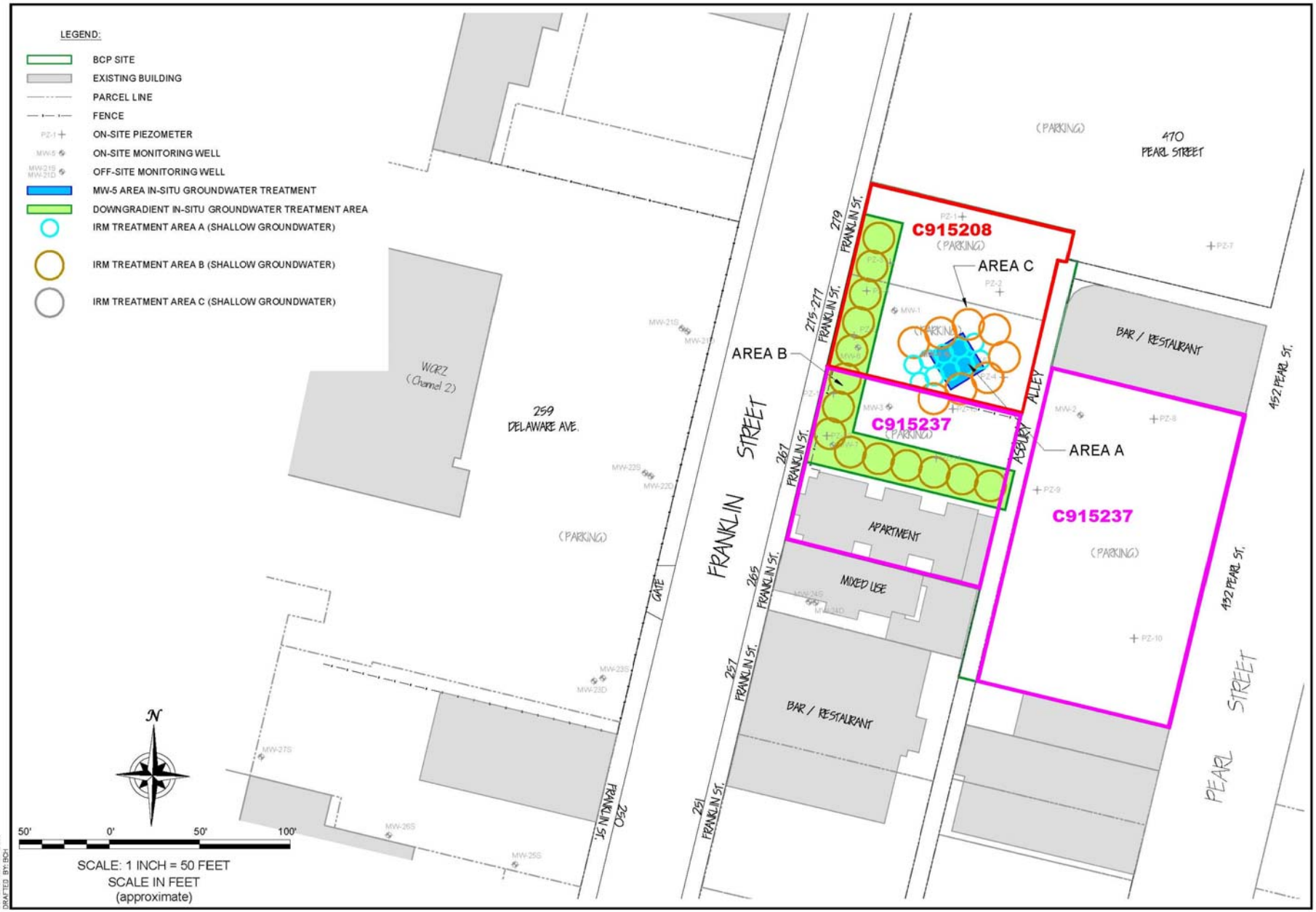
Figure 4



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F:\CAD\Benchmark\Buffalo Development Corp\275 Franklin Street Site\RI-AA-IRM Report (Jan 2013)\Figure 18, Proposed Final GW Remedial Approach (Jan 2013).dwg

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PROPOSED FINAL GROUNDWATER REMEDIAL APPROACH

RI-AA-IRM REPORT

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Figure 5