PROPOSED REMEDIAL ACTION PLAN

Former Canada Dry Plant
State Superfund Project
Endicott, Broome County
Site No. 704050
February 2013

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

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of 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 document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

This PRAP has been prepared to address the Former Canada Dry Operable Unit 1, on site remedial program. Off site remedial actions necessary to address residual groundwater contamination and soil vapor intrusion will be administered under the June Street Plume Delineation site (No. 704051).

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

George F. Johnson Memorial Library
1001 Park Street
Endicott, NY 13760
Phone: 607-757-5350

A public comment period has been set from:

3/01/2013 to 3/30/2013

A public meeting is scheduled for the following date:

3/12/2013 at 6:00 PM

Public meeting location:

George F. Johnson Memorial Library – 1001 Park Street, Endicott, NY 13760

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 3/27/2013 to:

Benjamin Rung - bwrung@gw.dec.state.ny.us
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

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 Former Canada Dry Plant site (site), located at 2 and 7 Badger Ave., lies in a mixed commercial, industrial, and residential area in the Village of Endicott, Town of Union, Broome County. The site encompasses the entire 2 Badger Ave. parcel and the northwestern corner of 7 Badger Avenue.

Site Features:
The 2 Badger Ave. parcel contains one building currently occupied by a bottle redemption center. The portion of the 7 Badger Ave. parcel within the site boundary is paved and without structures. The site is flat and covered by structure or pavement. The Norfolk-Southern Railroad bounds the site on the north side. The north end of Badger Ave. lies within the site bounds.

Current Zoning / Uses:
The 2 Badger Ave. property is zoned commercial and contains one structure currently being used as a bottle redemption center. A small office and redemption space occupies the southeast corner of the building with the remainder dedicated to bottle and can sorting and storage. The portion of 7 Badger Ave. lying within the site bounds, also zoned for commercial use, is paved parking, used by redemption center trucks and patrons.

Past Use of Site:
Both 2 and 7 Badger Ave. were formerly owned by the Canada Dry Bottling Company and/or its successors. Canada Dry used the structures on both the 2 and 7 Badger Ave. properties for the production and bottling of carbonated beverages. The surrounding paved areas were used for trucking and storage of palletized accouterments.

While the production of carbonated beverages would not have been the source of chlorinated solvents observed in groundwater, the maintenance of production machinery and transport vehicles in close proximity to the floor drains and drywells is most likely the contributing source of contaminants. The portion of the 7 Badger Ave. property listed on the Registry of Inactive Hazardous Waste Disposal Sites is where an air-sparge/vapor extraction system was located in the early 1990s. This system was run for approximately 18 months in the location of the dry-well at the north end of Badger Ave., suspected to be the primary contaminant source.

Site Geology and Hydrology:
Surficial soils encountered at the site and surrounding areas are highly similar, generally consisting of brown to black, sand and gravel with trace silt. The thickness of unsaturated soils was variable across the site and generally consisted of sand with some gravel, trace silts. During the installation of on-site wells, groundwater was encountered at depths ranging from 9.5-feet to 12-feet below grade. Based on the results of the groundwater elevation surveys over the entire monitoring well network, flow in the overburden wells is generally divided into two flow directions. North of the Norfolk Southern Rail Road tracks and west of Duane Ave. groundwater flow is to the northwest toward the Nanticoke Creek. South of the rail road tracks, and from the subject site, groundwater flow in the overburden monitoring wells is to the northeast, east and southeast. The cause of the variability in the groundwater flow direction at the site is attributed

to the NYSDOT dewatering sump located at the railroad underpass on N. Nanticoke Avenue. The natural groundwater flow direction is to the southeast however the New York State Department of Transportation maintains under-drains and a sump at the intersection of Nanticoke Ave. and the Norfolk-Southern rail line. This sump creates a depression in the groundwater table whose influence is present at the subject Site.

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 commercial use (which allows for industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

ICS Industries,Inc.

Touhey Associates

Pepsi Cola & National Brand Beverage

Canada Dry Bottling Company

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

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

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. The tables found in Exhibit A list the applicable SCGs in the footnotes. 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 hazardous waste 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 in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

Trichloroethene
cis-1,2-Dichloroethene
Vinyl Chloride
Methylene Chloride
1,2,4-Trimethylbenzene

As illustrated in Exhibit A, 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 Record of Decision.

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

IRM - Dry-well Excavation

The IRM consisted of the excavation of a drywell in the northeast basement of 7 Badger Ave. structure. The concrete floor covering the drywell was opened; sediments present within drainage structure were removed along with the drywell crock which was constructed of masonry units laid on their side. Soils surrounding the structure that exceeded commercial use SCOs for metals, including – cadmium, chromium, lead, manganese and PCBs, were also removed. The excavation was backfilled with clean compacted fill meeting the requirements of DER-10, Appendix 5 and covered with concrete to match the surrounding surface.

IRM – Off-Site SSD System Installation

The Department began Soil Vapor Intrusion (SVI) sampling of homes in 2007 within the June St. Plume Delineation (Site No. 704051) study area bounds presented in Figure 2. The bounds of this study area were determined after extensive groundwater sampling and based on data collected during the Endicott Area Wide Study (Site No. 704038). Initial interpretations of groundwater data placed the source of the contamination present throughout the study area at the former Canada Dry site. For this reason, approximately 200 homes were sampled between 2007 and 2011 as part of the Canada Dry off-site SVI investigation. A majority of the structures sampled are located northwest of the subject site and are now understood to lie over a plume attributable to a source located at the intersection of Maple St. and Duane Ave. and historically may have been contributed to by Canada Dry. Of the homes sampled throughout the previously established study area, 81 have been mitigated, seven declined mitigation, 41 are in the monitor category and 154 required no further action to address soil vapor intrusion. From these numbers, those structures lying over the plume to the southeast and attributed to only the Canada Dry site,

include thirteen mitigated structures, twelve structures to be monitored and 25 which require no further action.

	Combined Plumes	Canada Dry Plume
Homes offered opportunity for sampling	~350	~190
Homes sampled	>200	45
Installed SSD operating systems	81	13
Homes continued in monitoring	41	12

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.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for OU 01.

Nature and Extent of Contamination:

Prior to Remediation –
Prior to registry listing of the former Canada Dry site, remedial work was performed in the early 1990s. At that time, two drywells and associated floor drains were excavated inside the building at 2 Badger Ave. Another excavation was completed immediately to the east of the building where miscellaneous debris was found and a fourth excavation was completed off the northeast corner of the building; this area is part of the 7 Badger Ave. parcel discussed above – at which a Soil Vapor Extraction (SVE)/Air Sparge system was operated. A total of four underground storage tanks (USTs) were removed from the site, two from within the footprint of the 7 Badger Ave. structure, the remaining two immediately east of the 2 Badger Ave. structure.

Beginning in 2011, a Remedial Investigation (RI) of the listed site found a TCE plume in groundwater (150 ppb) flowing predominantly east-northeast within the bounds of the 2 and 7 Badger Ave. site. The TCE plume observed in groundwater is present off-site to the east of the Canada Dry site and may have historically contributed to the plume present to the northwest. Soil samples collected during the RI found concentrations of methylene chloride and 1,2,4-trimethylbenzene (54 ppb and 7,000 ppb respectively) exceeding SCGs. The natural groundwater flow direction is believed to be divided on or to the north of the site. The predominant groundwater flow direction is to the southeast with a minority component of flow to the north or northwest, however, the New York State Department of Transportation maintains under-drains and a sump at the intersection of Nanticoke Ave. and the Norfolk-Southern rail line. This sump creates a depression in the groundwater table whose influence is present at the subject Site. Investigations performed prior to site listing found concentrations of TCE in the DOT sump exceeding groundwater standards, however; sampling of the outfall of this sump near the

Nanticoke Creek resulted in no concentrations of VOCs in exceedance of applicable surface water standards. Currently there is no contravention of surface water SGGs at the outfall of the collection sump or at the discharge of the retention pond to the creek. Therefore, no action is necessary at this discharge other than to comply with substantive content of permitting requirements.

The off-site downgradient neighborhoods have been investigated to determine the extent of contamination. A Soil Vapor Intrusion investigation was conducted and extensive structure sampling has been performed over the past five years resulting in the mitigation of a number of homes. Future operation and maintenance of the mitigated structures as well as additional evaluation of soil vapor intrusion, as necessary, will continue under the June St. Plume Delineation Site No. 704051.

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.*

People are not expected to come into direct contact with site-related contaminants in the soil because buildings and pavement cover most of the site. People may come into direct contact with site-related contaminants if they dig below the surface on-site. People are not drinking contaminated groundwater associated with the site because the area is served by a public water supply that obtains its 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. On-site soil vapor intrusion sampling has identified impacts to indoor air quality and actions have been recommended to address exposure concerns. Off-site soil vapor intrusion sampling has also identified impacts and actions have been taken to address exposures.

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.
- Prevent the discharge of contaminants to surface water.
- 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.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

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: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The estimated present worth cost to implement the remedy is $323,326. The cost to construct the remedy which is Soil Vapor Extraction is estimated to be $131,170 and the estimated average annual cost is $12,500.

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. Green Remediation -
Green remediation principals and techniques will be implemented to the extent feasible in the 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.

3. Soil Vapor Extraction (SVE) -
SVE will be implemented to remove volatile organic compounds (VOCs) from the subsurface beneath the 2 Badger Ave. structure and the area immediately north and east of the building. SVE systems remove VOCs from soil by introducing a vacuum in the vadose zone (the area below the ground but above the water table). The vacuum draws air through the soil matrix which carries with it the VOCs from the soil, and those emanating from groundwater, to the SVE

extraction point. The operation of the SVE system will provide soil vapor intrusion mitigation for the personnel working in the 2 Badger Ave. structure. The air extracted from the SVE extraction points is then treated, if warranted, prior to atmospheric discharged. The SVE system shall be operated until groundwater standards have been met or until such time as extracted air shows no VOC impacts, indicating the achievement of soil SCGs for protection of groundwater. Additionally, the SVE system, or sub-slab depressurization system if deemed appropriate, shall continue to operate until the potential for soil vapor intrusion has been eliminated. A pilot-scale blower test shall be conducted prior to design of the full-scale SVE system. Based on the radius of influence observed during pilot-scale tests, the necessary design of the SVE system will be determined. SVE extraction points will be installed in the vadose zone and screened from below the ground surface to a depth of approximately ten feet. It is anticipated, based on soil borings advanced during the Remedial Investigation, that up to twelve SVE extraction points will be necessary to address the contaminant remaining beneath the 2 Badger Ave. structure and the area immediately north and east of the building. The air containing VOCs extracted from the SVE extraction points will be treated, as necessary, to attain DEC Division of Air emission contaminant guidelines prior to it being discharged to the atmosphere.

4. Institutional Control –
Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- Requires a 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 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 New York State and/or Broome County Departments of Health;
- Requires compliance with the Department approved Site Management Plan.

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

1.) 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 above.
- Engineering Controls: The Soil Vapor Extraction system discussed above

This Site Management Plan also 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 contaminated soil under the 2 Badger Ave. building if and when the building is demolished or becomes vacant;

- descriptions of the provisions of the environmental easement including any land use, or groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any 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 engineering controls.

2.) 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;
- a schedule of monitoring and frequency of submittals to the Department;
- monitoring for vapor intrusion for any buildings occupied or developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

3.) An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:

- compliance monitoring of the SVE treatment system to ensure proper Operation & Maintenance as well as providing the data for any necessary permit or permit equivalent reporting;
- maintaining site access controls and Department notification; and
- providing the Department access to the site and Operation & Maintenance records.

6. Cover System –

A site cover currently exists in the form of facility structures and surrounding pavement. Site cover will be maintained to allow for commercial use of the site. 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 one 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 one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial 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).

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium in which contamination was identified, a table summarizes the findings of the investigation. Each table presents the range of contamination found at the site in the identified media and compares the data with the applicable Standards, Criteria and Guidelines (SCGs) for the site. The contaminants are arranged in four categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the applicable SCGs, allowing for unrestricted use, are provided for each medium. For soil and sediment, if applicable, the Restricted-Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Waste/Source Areas

As described in the Remedial Investigation (RI) report, waste/source materials were identified at the site and are impacting groundwater, soil, and soil vapor.

Wastes are defined in 6 NYCRR Part 375-1.2(aw) and include solid, industrial and/or hazardous wastes. Source areas are defined in 6 NYCRR Part 375(au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

A source area has been identified at the subject site beneath the 2 Badger Avenue structure. The remaining contaminant source coincides with the floor drains and drywells previously removed from the northern portion of the structure floor. Methylene chloride and 1,2,4-Trimethylbenzene were found in the soils exceeding SCGs and the groundwater has been found to be impacted by trichloroethene and its degradation products. The presence of floor drains and drywells presented a pathway for contaminants to enter the subsurface throughout the time they were being employed. Figure 3 depicts the former Canada Dry site including the structure located on the 2 Badger Ave. property, the northwestern portion of the 7 Badger Ave. property, and the surrounding parcels. Findings of the groundwater and soil investigation are presented in the following sections and Tables 1 and 2.

A sediment sample from a remaining drywell, located on the off-site portion of the 7 Badger Ave. parcel, was collected during RI activities and revealed exceedance of the unrestricted and restricted use SCGs for inorganic compounds. The removal of the sediment and the drywell in which it was found was performed during an IRM at the site. Confirmatory samples show that sediments containing elevated metals concentrations have been removed and soils remaining are representative of background soils found throughout the site. Findings of the initial investigation sample results are presented in Table 3.

The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

During the Remedial Investigation (RI), ten wells were installed or recovered on the subject site well locations are depicted in Figure 4. Previous investigations left a number of wells throughout the property however most were not is serviceable condition. Those wells which could not be redeveloped were abandoned and replaced.

Groundwater samples were collected from overburden monitoring wells. Wells were installed to an average depth of 20 feet and screened across the groundwater surface. Samples were collected to assess groundwater conditions on and off-site. The results indicate that volatile organic compounds in shallow groundwater at the site exceed the groundwater SCGs. Two rounds of groundwater samples were collected and submitted for analysis from the on-site and existing off-site monitoring well network.

During the first round sampling event, thirty-six (36) groundwater samples were collected in June 2011 from the ten (10) groundwater monitoring wells on site, and twenty-six (26) existing off-site monitoring wells. All of the groundwater samples were analyzed for VOCs. Among the forty-six groundwater samples tested, three VOCs (trichloroethylene, cis-1,2 dichloroethylene and vinyl chloride) were detected at concentrations that exceed the groundwater SCGs for these compounds. There were no other exceedances of groundwater SCGs.

In the second sampling event, thirty-eight (38) groundwater samples were collected in October 2011 from the on-site and off-site monitoring wells. All the groundwater samples were analyzed for VOCs. Of the twelve VOCs detected, only three exceeded groundwater SCGs: trichloroethylene, cis-1,2-dichloroethylene and vinyl chloride. All other VOCs detected did not exceed standards.

The monitoring well network sampled during the RI included wells newly installed on-site and also a significant number of wells installed off-site during the June Street Plume delineation (Site No. 704051). The June St. Plume Delineation assessed an area of approximately 250 acres extending both northwest and southeast of the former Canada Dry site. Evaluation of sampling data and groundwater flow directions from several events, led the State to the conclusion that two distinct plumes exist in the vicinity of the Canada Dry site. One plume is located to the northwest, centered at the intersection of Jennings St. and North Duane Ave., flowing to the northwest toward June St. and the Nanticoke Creek. This northwestern plume has been determined to have historic contributions from the 312 Maple Street site and the former Canada Dry site. The second plume which is attributable to the former Canada Dry site originates at 2 Badger Ave. and flows to the northeast toward the NYSDOT sump at North Nanticoke St. and to the southeast, which represents the direction of groundwater flow. Evaluations of the overall groundwater plume and flow over time have revealed a distinct and persistent divide between the two plumes, as shown in Figures 5a and 5b. Based on this information, the Canada Dry RI and this plan address the remaining contamination located on the former Canada Dry site. The plume located to the northwest, and attributable to the 312 Maple site (Site No. B001687). , will be addressed by future activities associated with the June Street Plume Delineation site (No. 704051).

The following table (Table 1) presents the findings of the groundwater samples related to the Canada Dry site collected on-site and off-site immediately to the east. While monitoring wells to the northwest were sampled as part of the RI data gathering activities, data from those locations are not solely part of the Canada Dry site as they are commingled with another source. Concentrations of chlorinated volatile organic compounds observed throughout the monitoring well network have steadily declined over time. Exceedances of applicable SCGs persist in discreet areas of the study area which will be addressed by remedial activities, however; concentrations in a number of wells have declined to below SCGs. The natural attenuation of site-related contaminants is expected to continue.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b]	Frequency Exceeding SCG
VOCs June 2011			
1,1,1-Trichloroethane	**BD-2.2**	**5**	**0/10**
1,1-Dichloroethylene	**BD-2.9**	**5**	**0/10**
Benzene	**BD-0.63**	**1**	**0/10**
Bromodichloromethane	**BD-1.9**	**50**	**0/10**
Chloroform	**BD-4**	**7**	**0/10**
cis-1,2-Dichloroethylene	**BD-33**	**5**	**4/10**
Dibromochloromethane	**BD-0.96**	**20**	**0/10**
trans-1,2-Dichloroethylene	**BD-0.64**	**5**	**0/10**
Trichloroethylene	**BD-270**	**5**	**8/10**
Vinyl chloride	**BD-5.8**	**2**	**1/10**
VOCs October 2011			
1,1-Dichloroethylene	**BD – 3.6**	**5**	**0/10**
Chloroform	**BD – 0.78**	**7**	**0/10**
cis-1,2-Dichloroethylene	**BD – 40**	**5**	**4/10**
Trichloroethylene	**BD – 250**	**5**	**8/10**
Vinyl chloride	**BD – 6.1**	**2**	**1/10**

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b]	Frequency Exceeding SCG
SVOCs			
Not Sampled			
Inorganics			
Chloride	**53-1,200**	**500,000**	**0/9**
Nitrate	**1.4-5.3**	**10,000**	**0/9**
Sulfate	**40-300**	**250,000**	**0/9**

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
Additional compounds (e.g., diethyl ether) were detected at low concentrations but do not appear in the table as no cleanup objective exists in Part 375.
BD - below detection
NE - not established

The primary groundwater contaminants are trichloroethylene (TCE), cis-1,2 dichloroethylene and vinyl chloride, which are consistent with release and natural degradation of TCE. As noted in Figure 6a and 6b, the primary on-site groundwater contamination is located beneath the northern portion of the 2 Badger Ave. structure in the location of the previously removed floor drains and dry wells. An area of elevated TCE concentration exists off-site on the east side of the 7 Badger Ave. property.

Based on the findings of the RI, the presence of trichloroethene and its associated break-down products has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: trichloroethylene, cis-1,2 dichloroethylene and vinyl chloride.

Soil

During the installation of wells on the former Canada Dry site, soil samples were retrieved from soil borings. Soil samples were field-screened and the intervals of each boring exhibiting potential for contaminants were identified for laboratory analysis. Eight borings were advanced in order to install monitoring wells on the site.

Nine subsurface soil samples were collected from the eight boring locations during the RI in May 2011. Those boring locations are presented in Figure 4. All nine samples were analyzed for VOCs. There were two marginal exceedances; methylene chloride (11'-15' bgs) at 0.054 ppm (parts per million) and 1,2,4-Trimethybenzene (17'-18' bgs) at 7.0 ppm were detected

above the Unrestricted SCGs from the boring located in the northern portion of the 2 Badger Ave. structure. There were no exceedances of Restricted Residential, Commercial or Industrial Site Cleanup Objectives (SCOs). VOC results for subsurface soil samples are listed in Table 2 below.

Table 2 - Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
cis-1,2-Dichloroethylene	BD	0.25	0/9	59	0/9
Methylene chloride	BD – 0.054	0.05	1/9	51	0/9
Trichloroethylene	BD – 0.016	0.47	0/9	10	0/9
1,2,4-Trimethylbenzene	BD – 7	3.6	1/9	47	0/9
n-Butylbenzene	BD – 3.4	12	0/9	100	0/9
n-Propylbenzene	BD – 1.8	3.9	0/9	100	0/9
sec-Butylbenzene	BD – 1.4	11	0/9	100	0/9
Naphthalene	BD – 0.0006	12	0/9	100	0/9

Table 3 – Drywell Sediment

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
cis-1,2-Dichloroethylene	0.015	0.25	0/1	100	0/1
Methylene chloride	0.046	50	0/1	100	0/1
Trichloroethylene	0.031	0.47	0/1	21	0/1
SVOCs					
Benzo(ghi)perylene	0.17	100	0/1	100	0/1
Inorganics					
Arsenic	4.36	13	0/1	16	0/1
Barium	322	350	0/1	400	0/1
Beryllium	1.23	7.2	0/1	72	0/1
Cadmium	10.80	2.5	1/1	4.3	1/1

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Total Chromium	**124**	**1**	**1/1**	**110**	**1/1**
Copper	**238**	**50**	**1/1**	**270**	**0/1**
Total Cyanide	**0.32**	**27**	**0/1**	**27**	**0/1**
Lead	**743**	**63**	**1/1**	**400**	**1/1**
Manganese	**2,330**	**1,600**	**1/1**	**2,000**	**1/1**
Mercury	**0.77**	**0.18**	**1/1**	**0.81**	**0/1**
Nickel	**117**	**30**	**1/1**	**310**	**0/1**
Selenium	**8.38**	**3.9**	**1/1**	**180**	**0/1**
Silver	**3.02**	**2**	**1/1**	**180**	**0/1**
Zinc	**2,210**	**109**	**1/1**	**10,000**	**0/1**
Pesticides/PCBs					
PCB'S TOTAL	**0.72**	**1**	**0/1**	**1**	**0/1**

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil; BD Below Detection: NE Not Established
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.
Additional compounds (e.g., diethyl ether) were detected at low concentrations but do not appear in the table as no cleanup objective exists in Part 375.
BD - below detection
NE - not established

The primary soil contaminants observed in soils are methylene chloride and 1,2,4-Trimethybenzene, often associated with petroleum contaminants. As noted on Figure 7, the primary soil contamination is associated with the floor drains previously removed from the northern portion of the 2 Badger Ave. structure. Historically, a number of underground storage tanks (USTs) were present on both the 2 and 7 Badger Ave. properties. These USTs were removed in the early 1990s and this discreet petroleum-related soil contamination is believed to be a remnant of those structures.

Based on the findings of the Remedial Investigation, the presence of methylene chloride and 1,2,4-Trimethybenzene has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, methylene chloride and 1,2,4-Trimethybenzene.

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, indoor air inside structures, and outdoor air. At this site due to the

presence of buildings in the impacted area a full suite of samples were collected to evaluate whether actions were needed to address exposures related to soil vapor intrusion.

Soil vapor samples were collected from five temporary sub-slab soil vapor probe installations, two indoor locations and one outdoor location. Locations were chosen based on proximity to the source area on-site, and results from the groundwater and soil analytical sampling. On-site soil vapor intrusion evaluation samples were collected December 10 and 11, 2011 and submitted for analytical testing from a total of eight locations on-site and off-site.

The results of the soil vapor analysis indicated that there were VOC compounds detected in the five soil vapor, two indoor air, and one outdoor air sampling locations. These include low concentrations of chlorinated compounds (commonly associated with solvent degreasing and dry cleaning), and non-chlorinated compounds (commonly associated with petroleum products). Trichloroethylene (TCE) was detected in all sampling locations. The highest concentration of TCE appeared in a sub-slab sample, detected at 70.0 µg/m3 (micrograms per cubic meter). TCE exceeded guidance values at two additional locations. Methylene chloride was detected in all sampling locations. At all sample locations, most compounds, including trichloroethene and methylene chloride were detected at lower concentrations in the indoor air samples than concentrations detected in the sub-slab soil vapor samples indicating that an on-site indoor source was not present. In addition, the outdoor air sample had a TCE concentration of 0.47 µg/m3, and the other VOC compounds detected were typically the lowest results from the sampling event. Volatilized contamination from groundwater is expected to migrate as soil gas within the soil horizon above the groundwater table. Migration of soil gas contaminated with VOCs is less predictable than groundwater migration due to subsurface heterogeneities. The soil vapor results show a minimal to low impact from the Canada Dry site to the surrounding properties.

Based on the concentrations detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, the primary soil vapor contaminant of concern is trichloroethylene (TCE) which is associated with chemicals used in the maintenance of machinery and delivery vehicles at the former bottling facility. The predominant soil vapor contamination is found beneath the structure located on the 2 Badger Ave. parcel. The concentrations of soil vapor and indoor air for TCE were compared to the NYSDOH guidance for soil vapor intrusion, soil vapor/indoor air Matrix 1 for TCE. The action recommended according to NYSDOH guidance is to take no further action at all the sampling locations on 7 Badger Avenue and to monitor 2 Badger Avenue.

Based on the findings of the Remedial Investigation, the presence of trichloroethene (TCE) has resulted in the contamination of soil vapor. The site contaminant that is considered to be the primary contaminant of concern which will drive the remediation of soil vapor to be addressed by the remedy selection process is trichloroethene.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A. These proposed alternatives have been selected for review to address the marginal exceedances of Methylene Chloride and 1,2,4-Trimethylbenzene is soils and the presence of Trichloroethene, and its breakdown products, in groundwater. The selected remedy is expected to protect inhabitants of structures overlying and surrounding the site from potential exposures through soil vapor intrusion. Lastly, the selected alternative should address the continued migration of impacted groundwater from the Site to the east.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment. This alternative would leave the Site in its present condition and would not provide any additional protection to human health or the environment. The No Further Action alternative would not involve any surface soil, subsurface soil, groundwater, or soil vapor remedial activity beyond that previously performed through the IRMs. In addition, the No Further Action alternative would not place any institutional or engineering controls on the Site property, such as future land use restrictions, groundwater use limitations, and/or remediation through soil vapor extraction. However, the No Further Action alternative would include the abandonment of the on-site monitoring wells.

Present Worth: *$0*
Capital Cost: *$0*
Annual Costs: *$0*

Alternative 2: No Further Action with Site Management

The No Further Action with Site Management Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2 and Site Management and Institutional Controls and Engineering Controls are necessary to confirm the effectiveness of the IRM. This alternative maintains engineering controls which were part of the IRM and includes institutional controls, in the form of and environmental easement and site management plan, necessary to protect public health and the environment from contamination remaining at the site. As part of the site management plan, groundwater monitoring would be conducted to ensure that contaminant concentrations are decreasing over time.

Present Worth: *$58,991*
Capital Cost: *$20,560*
Annual Costs: *$2,500*

Alternative 3: In-Situ Thermal Treatment

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil cleanup objectives listed in Part 375-6.8 (a). This alternative would include: Electrical Resistance Heating (ERH) for in-situ thermal desorbtion and extraction of chlorinated and petroleum related chemicals from soils and groundwater.

In-Situ Thermal Treatment will be implemented to destroy or volatilize volatile organic compounds (VOCs) beneath the 2 Badger Ave. structure and surrounding area to the immediate northeast of the building. Electrical resistance heating is an in-situ technology that can remediate soil and groundwater impacted by chlorinated solvents and petroleum hydrocarbons regardless of soil type or saturation and has been shown to be beneficial over conventional in-situ technologies such as excavation and off-site disposal. Electrical resistance heating passes an electrical current through the contaminated soil. Resistance to this flow of electrical current warms the soil and groundwater above the boiling point turning groundwater and entrained contaminants to steam. Electrical energy converted to heat evaporates the target contaminants and provides steam as a carrier gas to sweep volatile organic compounds (VOCs) to vapor recovery wells. After the steam is condensed and the extracted air is cooled to ambient temperatures, the VOCs captured are treated using methods such granular activated carbon.

It is expected that it would take approximately four to six months to design and implement the remedy and approximately six months for remediation. Costs are based on completing a pre-design investigation, installation and operation of the thermal treatment system, and periodic groundwater, surface water, and soil vapor intrusion monitoring throughout remedial activities.

Present Worth:.....*$3,391,090*
Capital Cost:.....*$3,391,090*
Annual Costs:.....*$0*

Alternative 4: Soil Vapor Extraction

This alternative involves the installation and operation of a soil vapor extraction (SVE) system to reduce contaminant concentrations in the source area located beneath the northern half of the 2 Badger Ave. structure and the area immediately northeast of the structure. The SVE wells apply a vacuum to the subsurface that causes contaminated vapors to migrate toward the extraction wells. Vapors extracted from the ground will be treated as necessary prior to discharge to the atmosphere. This alternative assumes that the SVE system would require operation, monitoring and maintenance for approximately two years, and that groundwater monitoring would continue for 30 years to evaluate the effectiveness of the system.

SVE will protect human health and the environment by removing the contaminant mass from the soil beneath the site building. Removal of the contaminant mass will further reduce contamination of groundwater at and downgradient of the site. Additionally, the operation of the SVE system will provide soil vapor intrusion mitigation for the personnel working in the 2

Badger Ave. structure. Costs are based on completing a pre-design investigation, installation and operation of the SVE system and long-term groundwater quality monitoring.

Present Worth: *$323,326*
Capital Cost: *$131,170*
Annual Costs: *$12,500*

Alternative 5: Enhanced Reductive Dechlorination with Monitored Natural Attenuation

This alternative involves the application of amendment to the subsurface in order to stimulate the naturally occurring biota which subsequently breakdown contaminants through metabolic processes. Enhanced Reductive Dechlorination (ERD) with monitored Natural Attenuation (MNA) would utilize two alternatives to spot treat groundwater and soils to reduce the time of monitored natural attenuation needed. The combination of the two alternatives would reduce the monitoring time by remediating the contamination faster than just MNA alone. Bioremediation of VOCs depends upon natural processes such as aerobic and anaerobic biodegradation, dispersion, and volatilization to dissipate contaminants. As an overall-decreasing trend in TCE concentrations has been observed within the groundwater at the Site, enhanced bioremediation would remediate groundwater and soil impact at the Site. ERD is an anaerobic biodegredation practice of adding hydrogen (an electron donor) to groundwater and/or soil to increase the number and vitality of indigenous microorganisms performing anaerobic bioremediation (reductive dechlorination) on any anaerobically degradeable compound or chlorinated contaminant. Hydrogen Release Compound (HRC®), or a similar product, would be used as an amendment injected into the subsurface. HRC® type products are typically applied using direct-injection techniques. This process enables the viscous HRC® material to be pressure injected into the zone of contamination and moved out into the aquifer media. Once in the subsurface, HRC® can reside within the soil matrix fueling reductive dechlorination and promoting reducing aquifer conditions for periods of up to 24 months or longer.

Additional investigation for and design of the amendment application is anticipated to take six to eight months. Up to two injections would occur in the 2 Badger Avenue building and in surrounding Site areas. Groundwater monitoring for natural attenuation would continue for two to five additional years after the HRC® injections occurred to monitor the decreasing contamination.

Present Worth: *$300,550*
Capital Cost: *$147,440*
Annual Costs: *$9,960*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Further Action	$0	$0	$0
No Further Action w/ Site Management	$20,560	$2,500	$58,991
Electrical Resistance Heating	$3,391,090	$0	$3,391,090
Soil Vapor Extraction	$131,170	$12,500	$323,326
Enhanced Reductive Dechloronation with Monitored Natural Attenuation	$147,440	$9,960	$300,550

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Soil Vapor Extraction, as the remedy for this site. Alternative 4 would achieve the remediation goals for the site by increasing the flow-rate of air through the soil matrix through active vapor extraction, thereby stripping volatile chemicals from the impacted soils. The elements of this remedy are described in Section 7. The area to be addressed by the proposed remedy is depicted in Figure 8.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study (FS) report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The proposed remedy, Alternative 4 - Soil Vapor Extraction, is anticipated to satisfy this criterion by removing the remaining contaminant mass present in soils and volatilization which occurs from impacted groundwater. This Alternative will also act as an active sub-slab depressurization system. Alternative 4 addresses the source of the groundwater contamination, which is the most significant threat to human health and the environment. Alternative 1 - No Further Action does not provide any protection to public health and will not be evaluated further. Alternative 3 (In-Situ Thermal Treatment), by thermal desorbtion of soil contaminated above the Unrestricted soil cleanup objectives, meets the threshold criteria. Alternatives 2 and 5 also comply with this criterion but to a lesser degree or with lower certainty. Alternatives 2, 4 and 5 rely on a restriction of groundwater use at the site to protect human health. Alternative 4 may require a short-term restriction on groundwater use; however, it is expected the restriction will be able to be removed in approximately three years. The potential for soil vapor intrusion will be significantly reduced by Alternative 3 and 4. The potential for soil vapor intrusion will remain high under Alternatives 2 and 5. Soil vapor mitigation is required under Alternative 2 and 5 in order to protect human health.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.
Alternatives 3 and 4 comply with SCGs to the extent practicable. Both alternatives address source areas of contamination and comply with the restricted use soil cleanup objectives at the

surface through removal of the contaminant source in soils. These Alternatives also create the conditions necessary to restore groundwater quality to the extent practicable. Alternative 2 does not comply with SCGs and will not be evaluated further. Alternative 5 complies with this criterion but to a lesser degree or with lower certainty. Because Alternatives 3, 4, and 5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. It is expected that Alternatives 3 and 4 will achieve groundwater SCGs in less than two years, while groundwater contamination above SCGs will remain on-site under Alternative 5 for many years.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.
Long-term effectiveness is best accomplished by those alternatives involving total remediation of the contaminated soils in the unsaturated zone, Alternatives 3 and 4. Since most of the contamination remains beneath the northern half of the 2 Badger Ave. structure, Alternatives 3 and 4 are the most applicable for total removal of the chemical contamination at the site and also removes the need for property use restrictions and long-term monitoring. Alternative 5 would result in the removal of approximately 90% of the contaminated soil at the site. Alternatives 4 and 5 require an environmental easement and long-term monitoring.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.
Alternative 3, thermal desorbtion of contaminants from soil and groundwater, reduces the toxicity, mobility and volume of on-site waste by transferring the material to an air mass which is then recovered for subsequent treatment. Alternative 3 would permanently reduce toxicity and mobility of the wastes remaining at the site. Alternative 4 reduces toxicity and mobility of remaining wastes by volatilization of contaminants from unsaturated soils. The effectiveness of Alternative 4 is less certain due to variability in soils. Alternative 5 reduces toxicity of the contaminants present in groundwater and to a lesser degree in unsaturated soils. Alternative 5 does not guarantee a reduction in mobility due to the application of the amendment to the sub surface by injection of an aqueous solution.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.
Alternatives 3, 4 and 5 all have short-term impacts and are expected to achieve remedial goals; however, Alternative 5 would have the least short-term impact. The time needed to achieve the remediation goals is the shortest for Alternative 3, however, only marginally longer for Alternative 4. Alternative 3 and 4 both have impacts to the facility in their implementation. Both remedies require a significant amount of infrastructure improvements and equipment to

achieve remedial goals and the time period for implementation and achievement of remedial goals is approximately two years. Alternative 5 takes the longest to achieve the remediation goals. Consideration of environmental impacts is assessed during selection of a remedial technology. Alternative 3, Electrical Resistance Heating, requires considerable amounts of electrical energy to heat soils and groundwater to the point of evaporation. The source of electricity for this process originates from a number of sources, but most commonly coal-fired power plants resulting in a very large carbon footprint. Alternative 4, Soil Vapor Intrusion, also consumes electricity through the operation of fans. The electrical consumption of these fans is significantly less than Alternative 3. Alternative 5, Enhanced Reductive Dechlorination, uses very little energy in its application. However, great consideration and care must be given to the intentional introduction of any amendment to the subsurface. Interactions with the existing subsurface soils and biota must be fully understood prior to the introduction of foreign material.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternatives 3, 4 and 5 area each implementable, but the constructability of remedial systems and injection of amendments to the sub-surface would disrupt facility activities and use for several years. Alternative 3, having an approximate duration of eighteen months for implementation, requires upgrades to electrical utilities servicing the site. The presence of the electrodes and vapor recovery equipment associated with the technology would preclude the use of a majority of the 2 Badger Ave. structure by the current site owner. Alternative 3 is anticipated to completely remediate the remaining contaminant and would therefore have limited administrative requirements. Alternative 4 would have an implementation period of approximately two years but would not require upgrades to existing on-site utilities. Vapor extraction wells and associated piping could be placed beneath the slab and ground surface allowing for use of the impacted space after construction. Alternative 4 is anticipated to achieve near complete removal of the remaining contaminant source, however, due to variability in soils monitoring and administrative efforts would be required for a period after implementation to assess effectiveness. Alternative 5 is implementable in approximately six months and poses no limitations to on-site structure use after initial injections of the amendment. Alternative 5 requires long-term monitoring and administrative evaluation of the technology.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly. With its intense energy consumption and installation costs, Alternative 3 (in-situ thermal treatment) would have the highest present worth cost. This Alternative has no annual cost associated with it however due to the anticipated total remediation of the site-related contaminants. Alternative 4 is less expensive than Alternative 3, yet it would provide equal protection of the groundwater resource. Alternative 4 has an annual short-term cost associated with monitoring of the remedies effectiveness. The present worth

costs of Alternative 5 is the least but has a higher annual cost associated with the long-term monitoring and administrative requirements.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.
Since the anticipated use of the site is commercial, Alternative 3, 4 and 5 would treat the contaminated soil to appropriate cleanup objectives. However, the potential residual contamination with Alternatives 4 and 5 would be controllable with implementation of a Site Management Plan. With Alternative 3, removing all of the contaminant from soil and groundwater, restrictions on the site use would not be necessary.

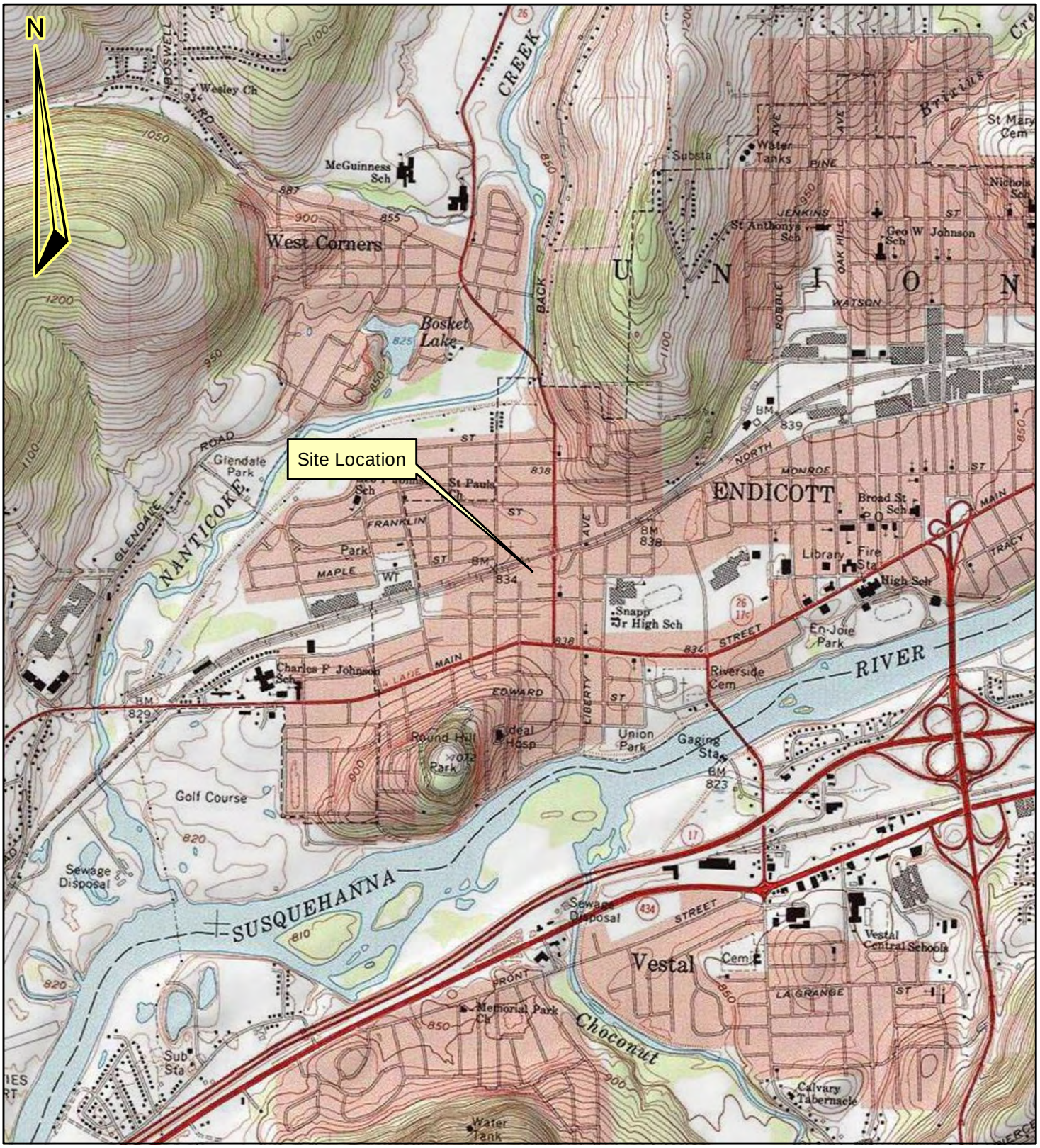
The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 4 – Soil Vapor Extraction is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion. The table below illustrates how the proposed remedy will achieve the RAOs selected for this site.

Remedial Action Objectives (RAOs)	**Selected Remedial Actions**
Groundwater RAOs for Protection of Public Health	
Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards	Drinking water is supplied by the municipality in this area. Institutional Control included in Site Management Plan to prevent the use of groundwater as a potable source.
Prevent contact with, or inhalation of volatiles, from contaminated groundwater	Installation of a sub-slab depressurization system beneath the occupied portion of the subject structure and off-site structures, as necessary.
Groundwater RAOs for Environmental Protection	
Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable	Monitoring of dilute constituent plume. Removal of contaminant from soils via the SVE system will reduce the migration of contaminants into the groundwater.
Remove the source of ground or surface water contamination	Soil Vapor Extraction of the contaminants.

Remedial Action Objectives (RAOs)	Selected Remedial Actions
Prevent the discharge of contaminants to surface water	NYSDOT under-drain sump at Nanticoke and rail-road collects downgradient groundwater and transfers it by pump and culvert to Nanticoke Creek. Through this process, site related COCs are volatilized and discharge to creek is below applicable surface water standards. The need for Permit of this discharge shall be evaluated at a future date. Removal of contaminant from soils via the SVE system will reduce the migration of contaminants into the groundwater.
Soil RAOs for Protection of Public Health	
Prevent ingestion/direct contact with contaminated soil	Structure slab and surrounding pavement to stay in place. Environmental Easement to be placed upon subject property. Site Management Plan contains an Excavation Plan to address contact with contaminated soils.
Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.	Installation of a sub-slab depressurization (SSD) system beneath the occupied portion of the subject structure and off-site structures, as necessary
Soil RAOs for Environmental Protection	
Prevent migration of contaminants that would result in groundwater or surface water contamination	Soil Vapor Extraction of the contaminants.
Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain	Structure slab and surrounding pavement to stay in place. Environmental Easement to be placed upon subject property
Surface Water RAOs for Protection of Public Health	
Prevent ingestion of water impacted by contaminants	NYSDOT under-drain sump at Nanticoke and rail-road collects downgradient groundwater and transfers it by pump and culvert to Nanticoke Creek. Through this process, site related COCs are volatilized and discharge to creek is below applicable surface water standards. The need for Permit of this discharge shall be evaluated at a future date.
Prevent contact or inhalation of contaminants from impacted water bodies	NYSDOT under-drain sump at Nanticoke and rail-road collects downgradient groundwater and transfers it by pump and culvert to Nanticoke Creek. Through this process, site related COCs are volatilized and discharge to creek is below applicable surface water standards. The need for Permit of this discharge shall be evaluated at a future date.
Prevent surface water contamination which may result in fish advisories	NYSDOT under-drain sump at Nanticoke and rail-road collects downgradient groundwater and transfers it by pump and culvert to Nanticoke Creek. Through this process, site related COCs are volatilized and discharge to creek is below applicable surface water standards. The need for Permit of this discharge shall be evaluated at a future date.
Soil Vapor RAOs for Protection of Public Health	
Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site	Installation of a sub-slab depressurization (SSD) system beneath the occupied portion of the subject structure and off-site structures, as necessary.



USGS Quadrangle Information
Quad ID: 42076-A1
Name: Endicott, New York
Date Rev: 1969
Date Pub: 1972

1 inch = 2,000 feet

0 1,000 2,000 4,000

Figure 1
Site Location
2 & 7 Badger Avenue
Endicott, New York
Site Number 704050

Scale 1" = 2,000'

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N

Property Boundaries
Study Area Bounds

0 200 400 800
Feet

1 inch = 400 feet

Figure 2
Former Canada Dry Site
NYSDEC Site No.704050

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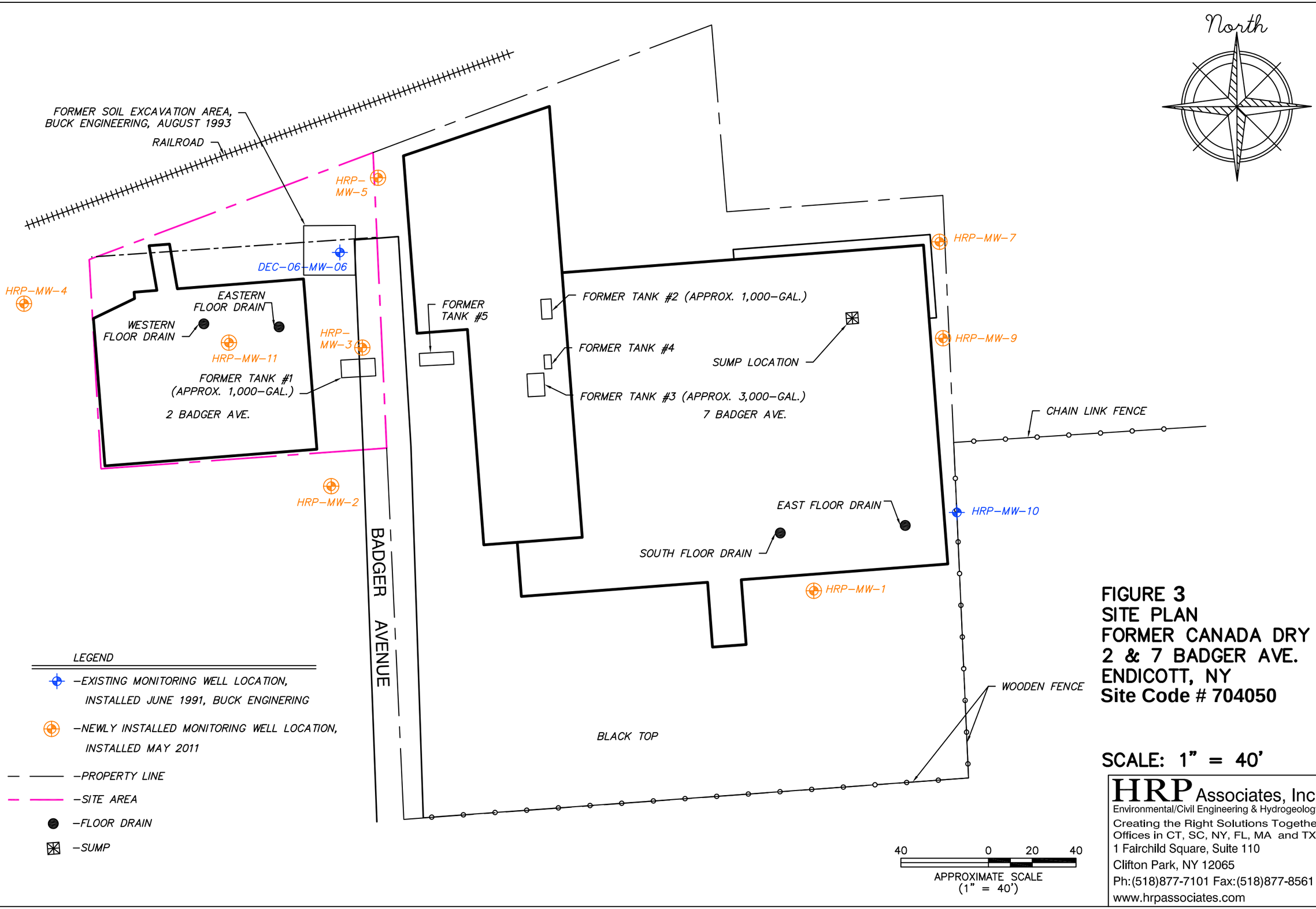

FIGURE 3
SITE PLAN
FORMER CANADA DRY
2 & 7 BADGER AVE.
ENDICOTT, NY
Site Code # 704050

SCALE: 1" = 40'

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HRP-MW-5		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	13	27

DEC-06-MW-6		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	140	110
CIS-1,2-DICHLOROETHYLENE	9.1	

HRP-MW-3		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	70	150

HRP-MW-7		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	95	140
CIS-1,2-DICHLOROETHYLENE	33	40.0

HRP-MW-9		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	400	250
CIS-1,2-DICHLOROETHYLENE	33	25

HRP-MW-10		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE		61
CIS-1,2-DICHLOROETHYLENE		24

HRP-MW-11		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	140	77
CIS-1,2-DICHLOROETHYLENE	10.0	11.0
VINYL CHLORIDE	5.8	5.1

HRP-MW-2		
YEAR 2011	JUNE	OCTOBER
TRICHLOROETHYLENE	9	11

North

RAILROAD

HRP–MW–5

HRP–MW–4

DEC–06–MW–06

NORTHERN FLOOR DRAIN

EASTERN FLOOR DRAIN

WESTERN FLOOR DRAIN

HRP–MW–11

HRP–MW–3

TANK #5

FORMER TANK #1 (APPROX. 1,000–GAL.)

2 BADGER AVE.

HRP–MW–2

BADGER AVENUE

MW–8 (DESTROYED)

HRP–MW–7

FORMER TANK #2 (APPROX. 1,000–GAL.)

TANK #4

SUMP LOCATION

FORMER TANK #3 (APPROX. 3,000–GAL.)

7 BADGER AVE.

HRP–MW–9

CHAIN LINK FENCE

EAST FLOOR DRAIN

HRP–MW–10

SOUTH FLOOR DRAIN

HRP–MW–1

WOODEN FENCE

BLACK TOP

LEGEND

–EXISTING MONITORING WELL LOCATION INSTALLED IN JUNE 1991 AND MAY 2011

–FORMER FLOOR DRAIN LOCATION

–PROPERTY LINE

–SITE AREA

NOTES:
CONCENTRATIONS IN ug/L (MICROGRAMS PER LITER)
SAMPLE EXCEEDS NYSDEC CLASS GA CRITERIA

40 0 20 40

APPROXIMATE SCALE
(1" = 40')

Figure 4
On-Site Monitoring Wells
GROUNDWATER RESULTS EXCEEDING NYSDEC STANDARDS
JUNE & OCTOBER 2011
FORMER CANADA DRY
2 & 7 BADGER AVE.
ENDICOTT, NY
Site Code # 704050

SCALE: 1" = 40'

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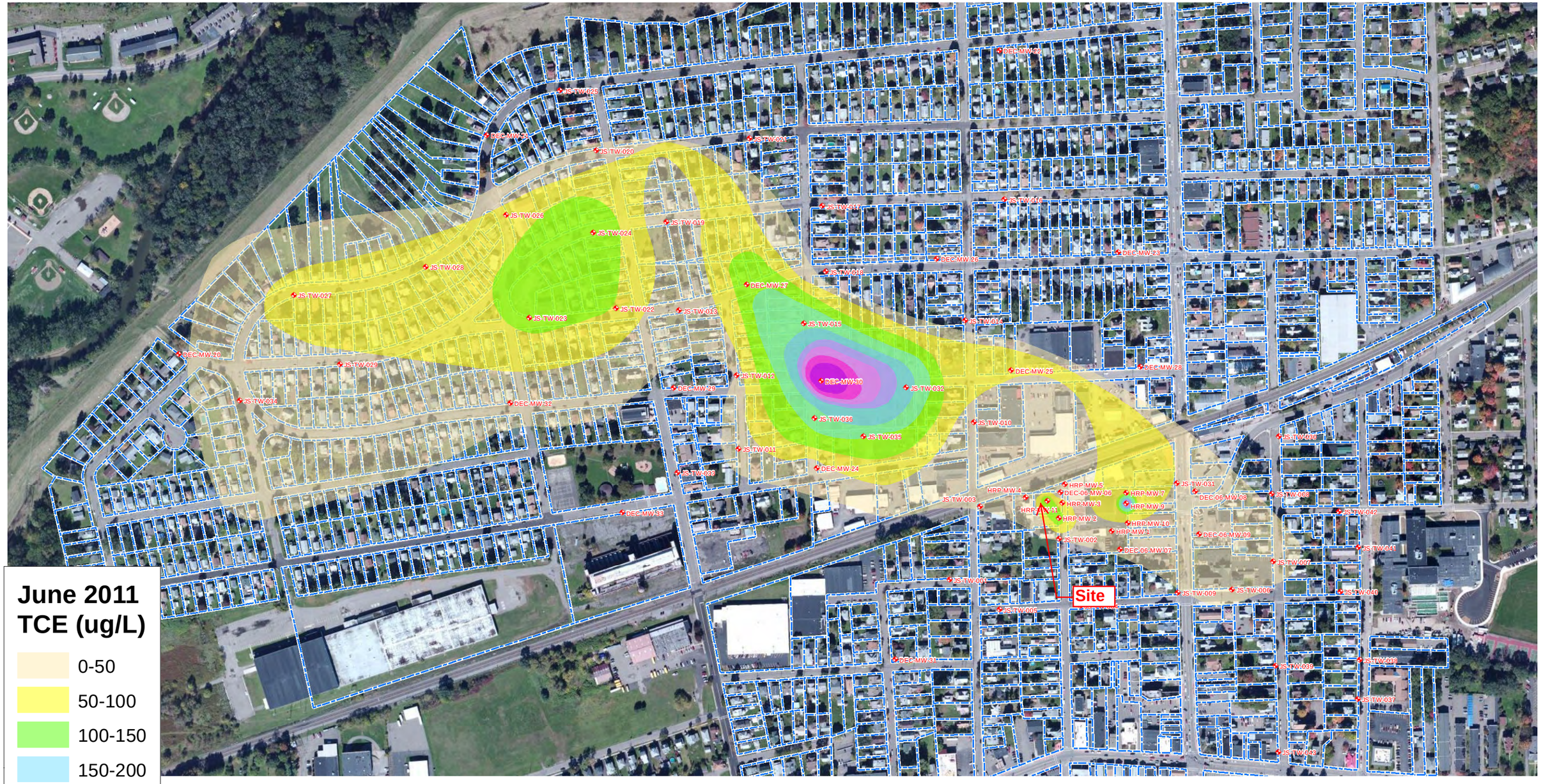

June 2011 TCE (ug/L)

- 0-50
- 50-100
- 100-150
- 150-200
- 200-250
- 250-300
- 300-350
- 350-400
- >400

1 inch = 400 feet

0 200 400 800 1,200 Feet

N

Figure 5A
Former Canada Dry Site
NYSDEC Site No. 7-04-050

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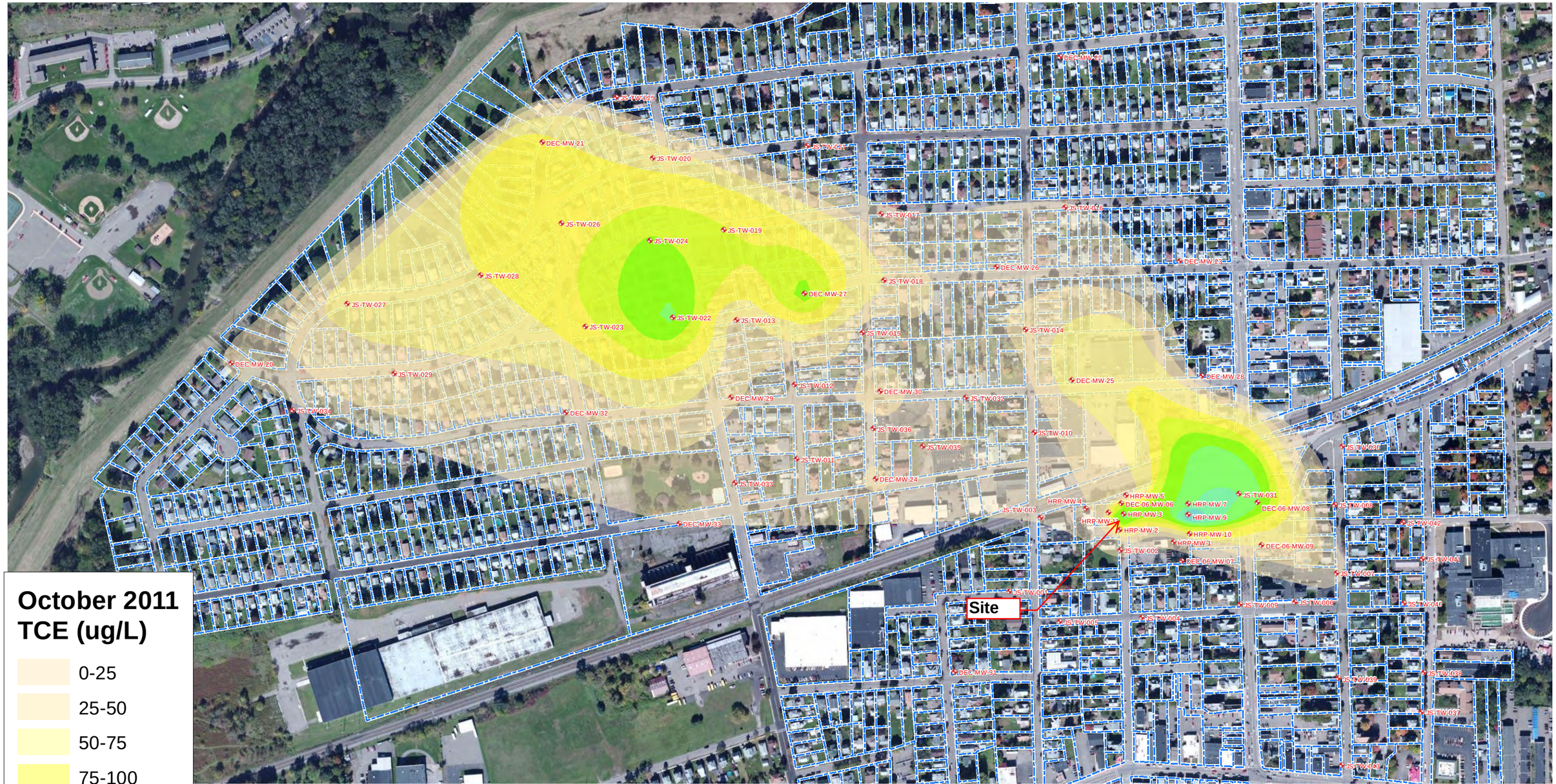

October 2011
TCE (ug/L)

- 0-25
- 25-50
- 50-75
- 75-100
- 100-125
- 125-150
- 150-175
- 175-200
- >200

1 inch = 400 feet

0 200 400 800 1,200 Feet

N

Figure 5B
Former Canada Dry Site
NYSDEC Site No. 7-04-050

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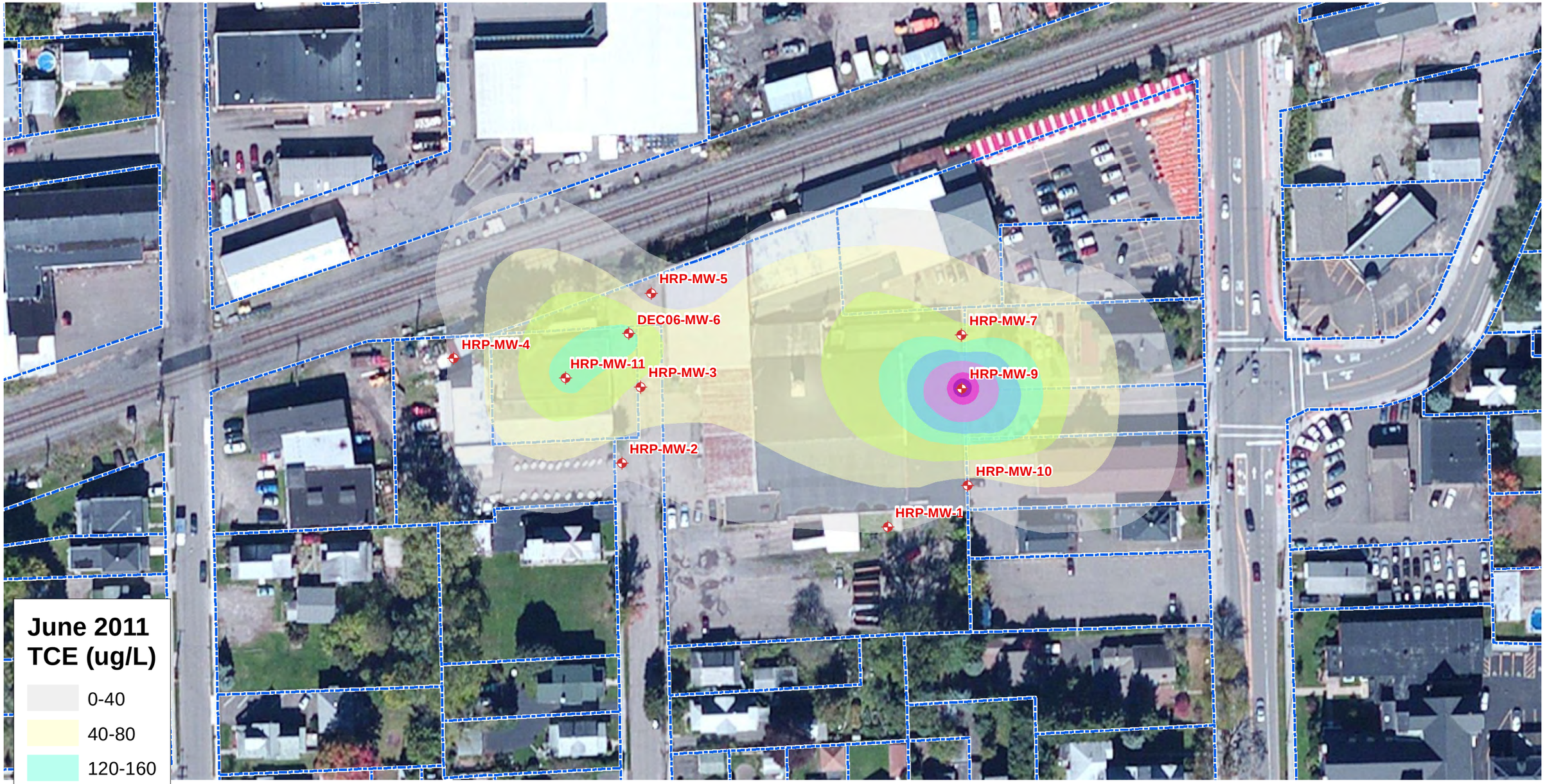

June 2011 TCE (ug/L)

- 0-40
- 40-80
- 120-160
- 160-200
- 200-240
- 80-120
- 240-260
- >260

1 inch = 80 feet

0 40 80 160 240 Feet

N

Figure 6A
Former Canada Dry Site
NYSDEC Site No. 704050

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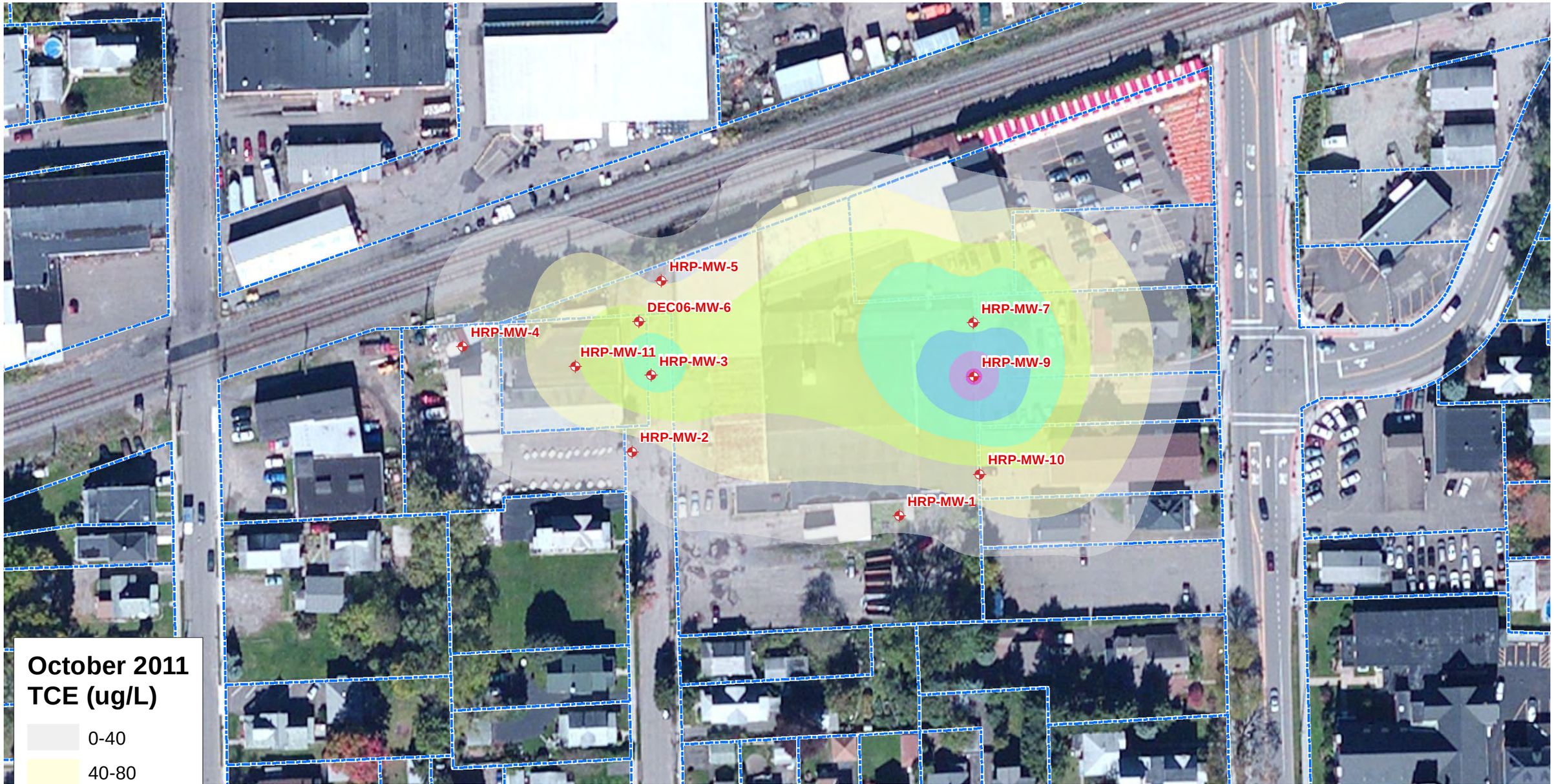

October 2011 TCE (ug/L)

- 0-40
- 40-80
- 80-120
- 120-160
- 160-200
- 200-240
- >240

1 inch = 80 feet

0 40 80 160 240 Feet

N

Figure 6B
Former Canada Dry Site
NYSDEC Site No. 704050

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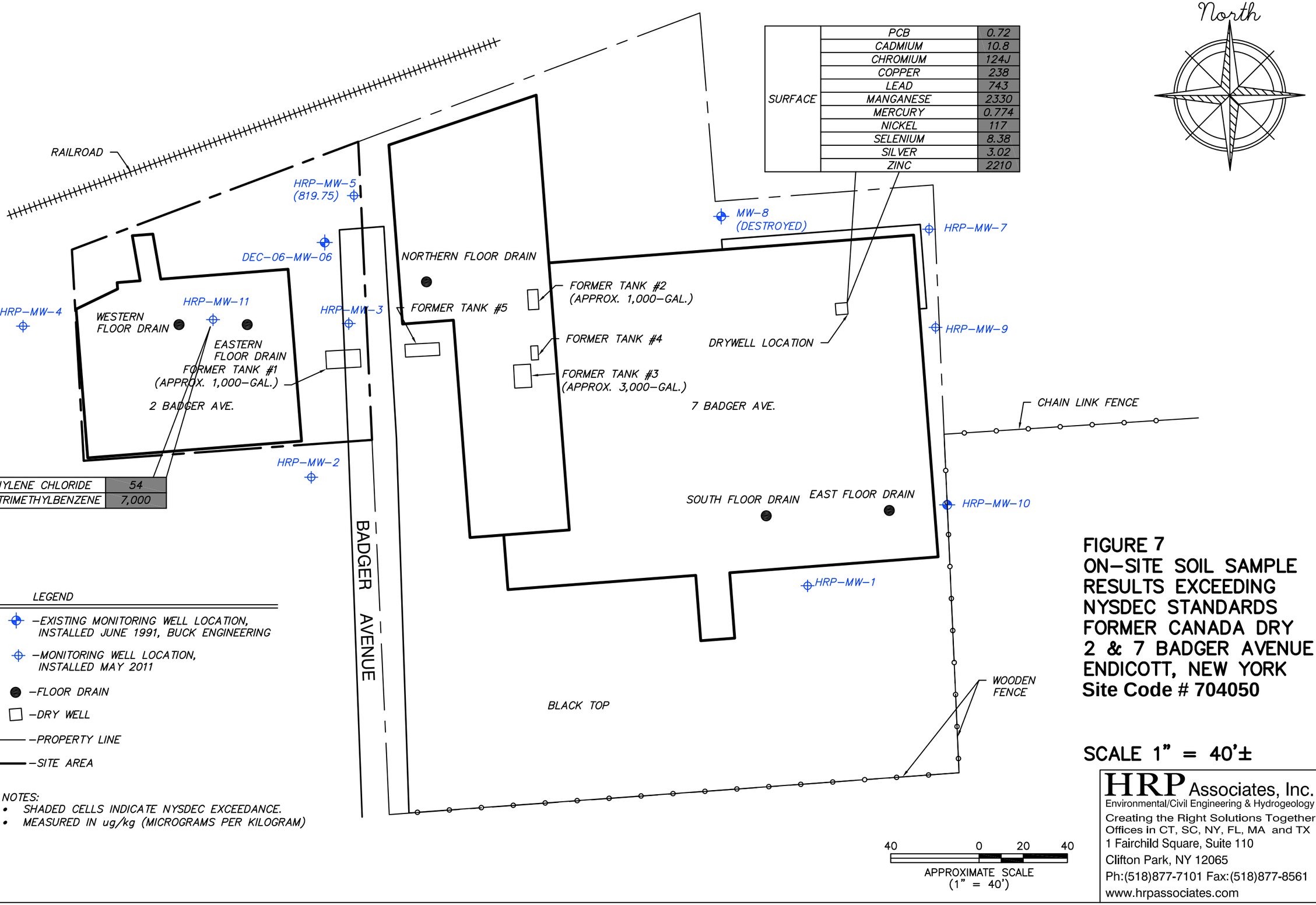

SURFACE	PCB	0.72
	CADMIUM	10.8
	CHROMIUM	124J
	COPPER	238
	LEAD	743
	MANGANESE	2330
	MERCURY	0.774
	NICKEL	117
	SELENIUM	8.38
	SILVER	3.02
	ZINC	2210

12 BGS	METHYLENE CHLORIDE	54
15 BGS	1,2,4–TRIMETHYLBENZENE	7,000

LEGEND

- –EXISTING MONITORING WELL LOCATION, INSTALLED JUNE 1991, BUCK ENGINEERING
- –MONITORING WELL LOCATION, INSTALLED MAY 2011
- –FLOOR DRAIN
- –DRY WELL
- –PROPERTY LINE
- –SITE AREA

NOTES:

- SHADED CELLS INDICATE NYSDEC EXCEEDANCE.
- MEASURED IN ug/kg (MICROGRAMS PER KILOGRAM)

FIGURE 7
ON–SITE SOIL SAMPLE RESULTS EXCEEDING NYSDEC STANDARDS FORMER CANADA DRY 2 & 7 BADGER AVENUE ENDICOTT, NEW YORK
Site Code # 704050

SCALE 1" = 40'±

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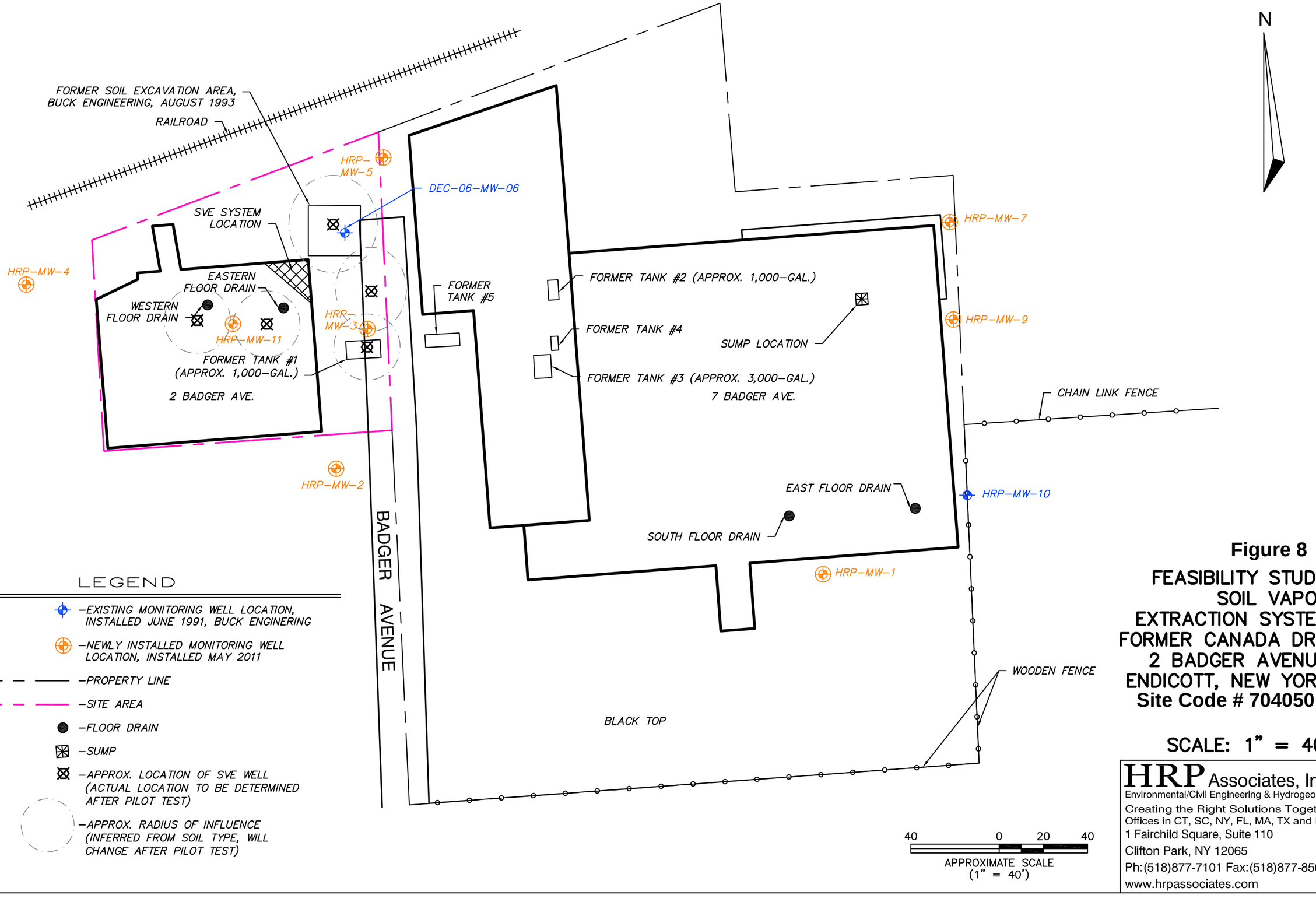

Figure 8

FEASIBILITY STUDY SOIL VAPOR EXTRACTION SYSTEM FORMER CANADA DRY 2 BADGER AVENUE ENDICOTT, NEW YORK Site Code # 704050

SCALE: 1" = 40'

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