PROPOSED REMEDIAL ACTION PLAN

Industrial Overall Service Corp.
Operable Unit Number 01: On-Site and Adjacent Metro North Property
State Superfund Project
New Rochelle, Westchester County
Site No. 360109
February 2018

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 repositories identified below.

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 repositories:

New Rochelle Public Library
1 Library Plaza
New Rochelle, NY 10801
Phone: 914-632-7878

New York State Department of Environmental Conservation
Attn: Region 3 Headquarters

21 South Putt Corners Rd
New Paltz, NY 12561
Phone: 845-256-3000

A public comment period has been set from:

2/26/2018 to 3/28/2018

A public meeting is scheduled for the following date:

3/13/2018 at 7:00 PM

Public meeting location:

New Rochelle Public Library, 1 Library Plaza, New Rochelle 10801

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 3/30/2018 to:

Kiera Thompson
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
kiera.thompson@dec.ny.gov

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 Industrial Overall Service Corporation site is located at 10 Bartels Place in the City of New Rochelle, Westchester County. The site is located east of I-95 and west of US-1 (Huguenot Street) and it is bounded by Reylea Place, Bartels Place, Centre Avenue and the Metro North railroad property and tracks.

Site Features: The site is 0.42 acres in size and resides on a slightly sloping irregularly shaped parcel consisting of two tax parcels. The main site feature includes a six-sided building which occupies the majority of the property and a small parking area located to the south and southwest of the building.

Current Zoning/ Uses: This property is zoned for commercial use. The building is currently vacant and for sale. The surrounding area is a mix of commercial and residential establishments situated in an urban setting.

Past Uses of the Site: Industrial Overall Service Corporation operated at the current location as a uniform and industrial clothing dry cleaning/laundering facility, historically cleaning heavily soiled clothing from industrial, auto body and gasoline dispensing businesses from 1956 until 2010. Dry cleaning equipment was reportedly decommissioned in 1978, but water washing continued. From 1980-1998 Workingman's Closet, an embroidery and uniform retail outfit, operated on the second floor of the building. From 2010 until 2016, Apparel Plus Textile Rental LLC ran a rental linen service company on both floors of the building, which involved water laundering. Historically, a precision scale company also operated out of the second floor of the building from sometime between 1932 and 1956 until sometime before 1973 when Industrial Overall purchased the building to occupy it entirely. Based on a Sanborn Fire Insurance Map from 1931, the site previously operated an automobile sales and service business.

This site was divided into two operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable unit 1 (OU1) is the on-site and adjacent Metro-north property. OU1 consists of the entire site property with the addition of an off-site source area which lies to the northeast of the site on the adjacent Metro-north property.

Operable unit 2 (OU2) is the off-site groundwater plume and associated soil vapor intrusion impacts.

Site Geology and Hydrology: Groundwater is found in the overburden and in the bedrock. Groundwater is generally found 10 to 15 feet below ground surface and flows in a southwesterly direction. Overburden in the vicinity ranges in thickness from 2.2 feet to 32 feet, and consists of fill material (1-5 feet in thickness) and varied amounts of fine to coarse sand with varying amounts of silt. Below the sandy silt is a till like material. Depth to bedrock is variable across the site from

a depth of a few feet to over 35 feet below grade. Bedrock in the vicinity is a highly weathered rock which is undulating in nature and is generally more transmissive than the till-like overburden material directly above.

Operable Unit (OU) Number 01 is the subject of this document. All references to "site" in the remainder of this document apply to this OU.

A Record of Decision will be issued for OU 02 in the future.

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:

Industrial Overall Service Corporation
Derks Buick
Voland & Sons, Inc.

A settlement was reached by the Department with Industrial Overall Services Corporation. Remaining PRPs are subject to legal action by the state for recovery for all response costs that the state has incurred which are not part of the settlement.

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,
- Test pits, 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

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 for this Operable Unit at this site is/are:

tetrachloroethene (PCE)
trichloroethene (TCE)
cis-1,2-dichloroethene
vinyl chloride
1,1,1-TCA

As illustrated in Exhibit A, the contaminant(s) of concern at the site exceed the applicable SCGs for:

- groundwater
- soil

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.

Off-site Excavation of Contaminated Soil & Redirection of Surface Stormwater

An Interim Remedial Measure (IRM) consisting of two actions was completed in June 2014. First, PCE-contaminated soil, lint, and debris were excavated from areas of exposed soils or from areas where disposed lint trap waste lay atop asphalt. These areas included a portion of residential backyard adjacent to the Industrial Overall Services site, a small on-site area, and a small area on the Metro North property. Excavated materials were disposed off-site, and soils remaining in the residential yard portion of the excavation met residential use soil cleanup objectives (SCOs). Soil remaining in the on-site and Metro North portion of the excavation met commercial use SCOs. Wherever exposed soils were removed in all three areas (on-site, adjacent off-site Metro North Railroad, and adjacent residential property), demarcation material was laid down, and the excavation was backfilled with clean gravel, six inches of top soil meeting unrestricted use SCOs, and revegetated with seed and mulch. The second action occurred on Metro North property both immediately north of the site and adjacent to the IRM excavation, as well as an on-site area adjacent to the excavation. This action consisted of re-grading and the removal of soil, sludges, and lint piles as necessary in order to prevent surface run-off from entering the residential backyard and excavation area. Any competent asphalt existing underneath contaminated materials during the removal and re-grading effort was left intact. In addition, asphalt curbing was installed along the western edge of the site to redirect surface run-off and prevent off-site migration of contaminants from the site away from the residence and excavation area. The IRM Final Construction Completion Report for Industrial Overall Services is dated August 2015.

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.

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: The primary contaminants of concern at the site include the dry cleaning chemicals tetrachloroethene (PCE), trichloroethene (TCE) and their associated breakdown products. PCE and TCE are found in on-site and off-site soil and groundwater. Two primary source areas remain at and adjacent to the site. These include a lint trap within on-site building and an off-site debris and waste disposal area located to the northwest outside the building on the adjacent Metro North Railroad property.

Soil: Maximum concentrations of PCE and TCE in on-site soils/wastes located in the remaining lint trap source area exceed 21,000 parts per million (ppm) and 1,200 ppm, respectively. In addition to volatile organic compounds (VOCs), soils on- and off-site were also sampled for semi-volatile organic compounds (SVOCs) and metals. No SVOCs exceeded SCOs, but several metals (barium, cadmium, chromium, lead, and silver) exceeded their respective unrestricted use SCOs directly underneath the lint trap. Also under the lint trap, barium, cadmium, and lead exceeded commercial SCOs, while only barium out of these metals did not exceed protection of groundwater SCOs. Also chromium exceeds the protection of groundwater SCO in one off-site location. On-site and off-site soil contains VOCs mainly in the two source areas, but some soil located under the site parking lot also contained VOCs above protection of groundwater SCOs of 0.47 ppm for TCE and 1.3 ppm for PCE. Generally, however, concentrations of PCE and TCE in on-site soils decrease to below the soil cleanup objectives (SCOs) for the protection of groundwater not far from the actual lint trap. The debris and waste disposal source area on the off-site Metro North property contains a maximum PCE concentration of 500 ppm and a maximum TCE concentration of 11 ppm.

Groundwater: Contamination migrating from the two source areas has impacted groundwater in the bedrock and overburden, and created a plume extending downgradient (southwest) more than 1,900 feet from the site. The highest level of PCE in on-site groundwater was 140,000 parts per billion (ppb) near the lint trap, compared to the groundwater standard of 5 ppb. On the adjacent off-site Metro North Railroad property, PCE concentrations in groundwater reached 3,600 ppb. The maximum level of TCE in on-site groundwater was 13,000 ppb near the lint trap, and 1,800 ppb beneath the adjacent off-site Metro North Railroad property, compared to the groundwater standard of 5 ppb. TCE was also detected upgradient of the site at 5300 ppb indicating a second potential off-site upgradient source. Several breakdown products of PCE and TCE were also noted in the groundwater. The maximum on-site cis-1,2 dichloroethene (cis-1,2 DCE) concentration was 27,000 ppb near the lint trap, and 130 ppb beneath the off-site adjacent Metro North Railroad property. The maximum on-site vinyl chloride (VC) concentration was 1,600 ppb near the lint trap compared to the groundwater standard of 2 ppb.1-1-1 trichloroethane (1,1,1-TCA) was detected on-site at a maximum concentration of 730 ppb beneath the on-site building, compared to the

groundwater standard of 5 ppb. However, 1,1,1-TCA was also detected upgradient of the site at 910 ppb indicating an off-site, upgradient source.

Soil Vapor, Sub-slab Vapor and Indoor Air: Samples were not collected on-site because the site is vacant.

Special Resources Impacted/Threatened: The site is located in an urban area of the City of New Rochelle. No significant environmental resources have been identified near the site.

6.4: Summary of Human Exposure Pathways

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

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. Most of the site is covered with pavement and buildings; however, trespassers or employees walking, digging, or otherwise disturbing the soil on the adjacent Metro North property could come in contact with site-related contaminants. Volatile organic compounds in the soil or 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. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment. Sub-slab depressurization systems have been installed in two off-site residential buildings to prevent the inhalation of site-related contamination. In addition, air monitoring is on-going at five additional off-site residential buildings to verify further actions are not needed. Sampling indicates soil vapor intrusion may be a concern for additional off-site buildings and sampling is recommended.

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

- 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: 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 proposed remedy is referred to as the Source Area and Source Soil Removal and In-situ Chemical Oxidation remedy.

The estimated present worth cost to implement the remedy is $2,810,000. The cost to construct the remedy is estimated to be $2,320,000 and the estimated average annual cost is $16,400.

The elements of the proposed remedy are as follows:

1. Remedial Design

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

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

2. Excavation

Excavation and off-site disposal of source soil, wastes, and lint sludges from two areas: the lint trap source area located inside the on-site building around the lint trap; and the remaining soil and debris pile source area located off-site outside the building on the adjacent Metro North Railroad property. Excavation inside the building will be limited by the need to maintain the integrity of the building and the excavation on the Metro North Railroad property may be limited by the active railroad tracks.

Excavation and off-site disposal of contaminant source areas will occur, including:

- grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u);
- concentrated solid or semi-solid hazardous substances per 6 NYCRR Part 375-1.2(au)(1) such as lint or laundry waste sludge;
- non-aqueous phase liquids;
- soil with visual waste material or non-aqueous phase liquid;
- soil which exceeds the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in site groundwater above standards; and
- off-site soils, wastes, and lint sludges containing site-related contaminants of concern at levels exceeding residential and protection of groundwater SCOs.
- soil that creates a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

3. Backfill

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) for commercial use and protection of groundwater will be brought in to replace the excavated soil and establish the designed grades at the two source areas. The lint trap area will be backfilled with clean material to the degree as required for maintaining structural integrity of the building. For the off-site debris

and waste disposal area, backfill meeting residential and protection of groundwater SCOs suitable with the current use as a railroad right of way will be brought in to replace the excavated soils on the adjacent Metro North Railroad property.

4. Cover System

A site cover, including parking areas and sidewalks, currently exists at the site not occupied by buildings, and will be maintained to allow for commercial use of the site. Any future site redevelopment will maintain the existing site cover. A site cover may include paved surface parking areas, sidewalks, or soil where the upper one foot of exposed surface soil meets the applicable soil cleanup objectives (SCOs) for commercial use. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6NYCRR part 375-6.7(d).

5. In-Situ Chemical Oxidation

At the conclusion excavation activities in the two source areas, in-situ chemical oxidation (ISCO) will be implemented to treat any remaining tetrachloroethene (PCE), trichloroethylene (TCE) and their associated breakdown products in soils and groundwater. A chemical oxidant such as permanganate will be injected into the subsurface to treat the remaining contaminants in the two contaminant source areas: in an approximately 1,000 square foot area in the vicinity of the active lint trap; and in an approximately 900 square foot source area on the off-site adjacent Metro North Railroad property. Oxidants will be introduced via injection wells, the method and depth of which will be determined during the remedial design. However, injections in the lint trap area must infiltrate below the lint trap structure in order to address contaminants remaining after excavation.

In addition, a series of permanganate cylinders will be installed downgradient of the source areas to allow ISCO to occur in groundwater leaving the site. Two rows of cylinders approximately 10 feet apart will be installed in a staggered fashion. Each row will include approximately 30 locations spaced 8-feet apart. Half of the locations will be completed as wells to allow replacement of cylinders in three years, the other half of the cylinders will be placed in a borehole and backfilled with sand.

6. Institutional Control

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

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

7. Site Management Plan

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

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

Institutional Controls: The Environmental Easement discussed in Paragraph 6 above, Institutional and Engineering Controls certification, groundwater use restriction, and land use restriction.

Engineering Controls: The soil cover discussed in Paragraph 4, and the ISCO treatment system discussed in Paragraph 5.

This plan includes, but may not be limited to: an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

- a provision for demolition of the on-site building if and when it becomes unsafe or inactive or vacant;
- a provision should redevelopment occur to ensure no soil exceeding protection of groundwater concentrations will remain below storm water retention basin or infiltration structures.
- a provision for removal or treatment of any other source area located under the on-site building if and when the building is demolished or becomes vacant;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion if the existing on-site building is reoccupied, and for any new buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 3 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs)
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or 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, as may be required by the Institutional and Engineering Control Plan discussed above.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were 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 for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into two categories: volatile organic compounds (VOCs) and inorganics (metals). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, 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 RI report, waste/source materials were identified at and near the site. These contaminants are impacting groundwater and soil in OU1 and soil vapor and indoor air in OU2.

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. Two waste disposal/source areas have been identified at the site including a subsurface lint trap structure located within the site building along the southern wall and a debris pile located off-site to the northwest on the adjacent Metro North Railroad (MNR) property. The lint trap collects laundry waste and waste water which is discharged to the municipal sanitary sewer. The debris pile appears to be the disposal location of lint sludge removed from the lint trap. Figure 1A depicts the two source area locations.

Soil and groundwater contaminants include chlorinated volatile organic compounds (CVOCs) including tetrachoroethene (PCE) and its breakdown products trichloroethene (TCE), cis-1,2 dichloroethene (cis-1,2 DCE), and vinyl chloride (VC), which are related to the chlorinated solvent disposal associated with the past use of the site. The dry cleaning and laundering process generates lint which is trapped by the four foot by six foot by nine foot concrete and brick lint trap structure before discharge into the municipal sanitary sewer system. At various times, lint sludges in the lint trap were cleaned out and disposed on the ground surface, both at the on-site asphalt parking lot and the off-site MNR property area. Both source areas contributed to the current soil and groundwater contaminant plume. The high concentration of PCE in both overburden and bedrock groundwater near and immediately downgradient of the lint trap indicate that dense non-aqueous phase liquid (DNAPL) free product may be present. 111-tricholorethane (111-TCA) is also a soil and groundwater contaminant at the site, however upgradient off-site wells have detected higher concentrations than on-site which indicates an off-site source is likely present.

An Interim Remedial Measure (IRM), as described in Section 6.2, was completed at the site. The purpose of the IRM was to address exposure hazards by removal of contaminated soils and lint both a portion of the site, a residential property adjacent to the site, and on Metro North property adjacent to the site. The IRM reduced the total volume of source materials, but did not address them fully.

Certain waste/source areas identified at the site were addressed by the IRM(s) described in Section 6.2. The remaining two waste/source area(s) identified during the RI will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected from overburden and bedrock monitoring wells (many of which are depicted on Figure 1A) located in areas to assess groundwater conditions both on- and off-site. The results indicate that site-related contaminants in groundwater which exceed standards, criteria and guidance (SCGs) consist of CVOCs. Metals were also analyzed. One hundred fifty-three groundwater samples were collected from fifty-six monitoring wells on-site, and off-site both upgradient and downgradient of the site during the RI. Sixteen of these wells monitor groundwater in bedrock and forty of these wells monitor overburden groundwater.

A groundwater contaminant plume in both overburden and in bedrock, as depicted in Figures 3-7, contains mainly CVOCs and extends over 1,900 feet southwest from the site. The top of bedrock in the vicinity of this site undulates and forms a trough trending to the southwest along which the contaminant plume travels. Because these contaminants are generally denser than water, they tend to sink in the water column and travel along a dense or impermeable layer such as clay or bedrock until a fracture or other feature allows further settling.
As shown in Table 1, several contaminants exceeded the SCGs values. Contamination was detected above SCGs in both the overburden and bedrock groundwater.

Table 1 – Groundwater

Detected Constituents	Concentration Range Detected (ppb)	SCG (ppb)	Frequency Exceeding SCG
VOCs			
1,1,1-Trichloroethane	0.57 - 910	5	26 / 153
1,1,2-Trichloroethane	6.2 - 36	1	2 / 153
1,1-Dichloroethane	0.55 - 160	5	24 / 153
1,1-Dichloroethene	0.54 - 1700	5	37 / 153
1,2-Dichloroethane	0.25 - 14	0.6	3 / 153
Benzene	0.57 - 1.2	1	1 / 153
Chloroform	0.63 - 25	7	1 / 153
Cis-1,2-Dichloroethene	0.64 - 27000	5	57 / 153
Isopropylbenzene	0.53 - 85	5	5 / 153
Methyl Tertbutyl Ether	0.21 - 19	10	1 / 153
Methylene chloride	12 - 650	5	9 / 153
Tetrachloroethene	0.72 - 140000	5	87 / 153
Trichloroethene	0.51 - 13000	5	87 / 153
Vinyl chloride	0.86 - 1600	2	8 / 153
Metals			
Chromium	0.7 - 791	50	1 / 14
Iron	42.5 - 540	300	3 / 7
Manganese	32.6 - 3280	300	6 / 7

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).

Contaminants of concern (COCs) in groundwater are CVOCs which originated from the laundry operations and source disposal areas described above. PCE and its degradation products TCE, cis-1,2 DCE, and VC are the main COCs. 1,1,1 trichloroethane (1,1,1 TCA) was detected in a smaller area on- and off-site, and was also detected upgradient of the site, indicating that there is an upgradient source of 1,1,1 TCA migrating onto the site. In general, CVOC contaminant concentrations increase with depth in overburden and bedrock. The deepest groundwater sampled in the investigation, 89 feet below ground surface (bgs) in bedrock and just south of the site, had one of the highest concentrations of PCE (18,000 parts per billion (ppb)). The highest concentration detected in groundwater on the site was in a well set almost 16 feet below ground surface in the sand and gravel unit of the overburden (38,000 ppb) located on the western site parking lot.

Other VOC contaminants detected, such as benzene, isopropyl benzene, methyl tertbutyl ether, were not as frequently detected nor as high in concentration as site-related CVOCs, and appear to be associated with gasoline releases.

Three metals exceeded SCGs. Iron and manganese were found to be consistently elevated in upgradient background wells as well as on-site wells and downgradient wells. This indicates that the levels of iron and manganese in groundwater are consistent with area background concentrations and are not a site-related contaminant. Chromium was well below the SCG of 50 ppb in all samples aside from one sample taken from overburden groundwater from one location just downgradient from the site. Chromium concentrations sampled from wells located both up- and down-gradient from this location, as well as in the bedrock were all well below SCGs, indicating that chromium impacts to groundwater are not from the site, and are limited to the immediate area of off-site well MW-13.

Based on the findings of the RI, the past disposal of hazardous waste 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 onsite groundwater to be addressed by the remedy selection process are: PCE and its breakdown products TCE, cis-1,2 DCE, and vinyl chloride. Because of the large areal and deep extent of contamination in groundwater, the off-site overburden and bedrock groundwater will be further evaluated and addressed in operable unit 02.

Soil

Soil samples were collected from various depths on- and off-site during the RI. Subsurface soils were collected from depths ranging from 1 foot to almost 16 feet below ground surface (bgs) in order to assess soil contamination and impacts to groundwater. There are no exposed surface soils on the site, but surface soils were collected from the adjacent MNR property in the waste/source area from 0-2” in order to assess surficial contamination and direct human exposure.

As shown in Table 2, several contaminants exceeded the SCG values.
The results indicate that soils on and off the site exceed the unrestricted soil cleanup objectives (SCOs) for several VOCs in the subsurface. A few surface soils also exceed residential, commercial, and protection of groundwater SCOs for VOCs off-site. Some metals were also found to exceed SCOs in soils underneath the lint trap source area.

Table 2 - Soils

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG	Protection of Groundwater SCG[d] (ppm)	Frequency Exceeding Protection of Groundwater SCG
VOCs							
1,1,1-Trichloroethane	0.00095 - 2.5	0.68	2 / 382	500	0 / 382	0.68	2 / 382
Acetone	0.0018 - 0.81	0.05	6 / 331	500	0 / 331	0.05	6 / 331
Benzene	0.011 - 0.34	0.06	3 / 382	44	0 / 382	0.06	3 / 382
Chloroform	0.035 - 2.2	0.37	2 / 382	350	0 / 382	0.37	2 / 382
Cis-1,2-Dichloroethene	0.00067 - 1100	0.25	31 / 382	500	1 / 382	0.25	31 / 382
Ethylbenzene	0.025 - 93	1	10 / 382	390	0 / 382	1	10 / 382
Methylene chloride	0.011 - 0.17	0.05	16 / 382	500	0 / 382	0.05	16 / 382
Tetrachloroethene	0.00076 - 21000	1.3	133 / 382	150	16 / 382	1.3	133 / 382
Toluene	0.023 - 520	0.7	13 / 382	500	1 / 382	0.7	13 / 382
trans-1,2-Dichloroethene	0.0093 - 0.41	0.19	3 / 382	500	0 / 382	0.19	3 / 382
Trichloroethene	0.00063 - 1200	0.47	48 / 382	200	7 / 382	0.47	48 / 382
Vinyl chloride	0.015 - 36	0.02	14 / 382	13	1 / 382	0.02	14 / 382
Xylene, o	0.031 - 0.84	0.26	3 / 266	500	0 / 266	1.6	0 / 266
Xylenes (m&p)	0.072 - 2.4	0.26	4 / 266	500	0 / 266	1.6	1 / 266
Xylenes, Total	0.072 - 360	0.26	26 / 382	500	0 / 382	1.6	13 / 382
Metals							
Barium	49.4 - 760	350	1 / 5	400	1 / 5	820	0 / 5
Cadmium	0.057 - 37.8	2.5	1 / 5	9.3	1 / 5	7.5	1 / 5
Chromium	8.2 - 162	1	5 / 5	400	0 / 5	19	1 / 5
Lead	1.9 - 2580	63	1 / 5	1000	1 / 5	450	1 / 5
Silver	0.66 - 10.7	2	1 / 5	1500	0 / 5	8.3	1 / 5

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil.
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.

The COCs in soil at the site are PCE and its degradation products TCE, cis-1,2 DCE, and VC. Figure 2 depicts PCE contamination in soil. Surface soils exceeding contaminant SCOs are located solely in the source disposal area located on the MNR property. COCs in subsurface soils are for the most part situated around the two source/ waste disposal areas.

Other VOCs detected in excess of SCOs in soils on- and off-site are 1,1,1 TCA, found within the source area located on the MNR property and one location near the lint trap inside the IOS building; BTEX compounds (benzene, toluene, ethyl benzene, and xylenes) detected under the site building, particularly near the lint trap, and in the subsurface on the MNR property; chloroform which degrades into methylene chloride, both of which were only detected above SCOs on the MNR property in the subsurface, and acetone (a common laboratory contaminant) detected only on the MNR property. BTEX was not detected in groundwater at or downgradient from the site, therefore BTEX in soils is not contributing to site-related groundwater contamination.

Five soil samples were analyzed for metals underneath the building and underneath the lint trap to determine if dry cleaning operations and associated lint sludge contained elevated metals. Only the soils beneath the lint trap exceeded the SCOs for barium, cadmium, chromium, lead, and silver. Out of these metals, only chromium was detected in groundwater from one monitoring well during the RI, therefore metals contaminated soils are not largely impacting other soils or groundwater at and around the site.

SVOCs which were also analyzed in soils and were either not detected or detected at concentrations below unrestricted SCOs.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste 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, PCE and its breakdown products TCE, cis-1,2 DCE, and vinyl chloride.

Because the on-site building was unoccupied, no SVI sampling was conducted in OU1.

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.

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.

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 after the IRMs.

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

Alternative 2: Restoration to Pre-Disposal or Unrestricted Conditions

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: demolition of on-site building, excavation and off-site disposal of all impacted soils and weathered bedrock at the site to the depth of competent bedrock, and clean backfill to restore site grades. The remedy also includes dewatering, treatment, and disposal of water generated during the excavation, and a pre-design investigation to evaluate excavation support systems, excavation depths, and water pump tests.

Capital Cost: *$18,924,000*

Alternative 3: Source Area Removal, MNR Limited Excavation and Soil Cover, Source Area ISCO, and Perimeter Groundwater Extraction System

This alternative calls for the removal of contaminated soils in the lint trap source area, removal of soils exceeding commercial SCOs in the off-site source area located on the MNR property, in situ chemical oxidation (ISCO) to address soil and groundwater contamination outside of the two source areas, and installation of a perimeter groundwater extraction system to capture, treat, and recirculate groundwater to prevent contaminants in groundwater from leaving the site.

A pre-design investigation, including a constructability review of the lint trap removal, an ISCO pilot study, and a groundwater and soil analysis to provide additional characterization for ISCO injections and pump/treat/recirculation process will be performed to support remedial design.

Approximately 42 cubic yards (CY) of soils underneath the lint trap will be removed to the extent practicable and disposed off-site. The bottom of the lint trap, which is comprised of stones, bricks, cinders and mortar, will be removed to provide access to the soils. A vacuum truck will be used to remove soils to the extent feasible. The area will be backfilled with crushed stone and a perforated riser pipe will be installed to enable ISCO injections. Concrete will be poured to seal the bottom of the lint trap.

Approximately 90 CY of source soils exceeding commercial SCOs will be removed from an approximate 550 square foot (sf) area of the off-site MNR property for off-site disposal. The MNR property will be graded as necessary to install a minimum 1-foot soil cover meeting the requirements for commercial use. A small portion (880 SF) of asphalt parking area that overlies impacted soils on the MNR property will be removed and replaced following completion of all other remedial activities in order to minimize direct exposure to shallow soils.

After excavation and capping, chemical oxidants will be injected into the ground within the two source areas to address remaining soil and groundwater contamination. It is estimated that fifteen injection points will be installed in each of the two source areas, and material will be injected every two to four vertical feet starting at the water table and extending to the top of weathered bedrock. An approximate total of 70,000 lbs of potassium permanganate will be injected.

A site perimeter groundwater extraction, treatment, and recirculation system will be installed to further prevent contaminants in groundwater from leaving the site. Groundwater extraction will occur via a series of extraction wells downgradient of the source areas. Groundwater will be conveyed through below grade piping into a treatment system and pumped into a series of injection wells installed upgradient of the source areas. Groundwater treatment will consist at a minimum of bag filtration and a permanganate treatment tank.

The on-site asphalt parking lot and building slab will be evaluated and repaired as necessary for use as a site-wide cover system.

Alternative 3 utilizes Institutional Controls (ICs) to provide additional protection. The ICs include groundwater use and land use restrictions to prevent contact with any remaining contamination in soils and groundwater. A Site Management Plan (SMP) will be required to specify details of the ICs, and to provide for Operation, Management, and Maintenance (OM&M) of the Engineering Controls (ECs) in place on and off of the site.

Present Worth: *$3,030,000*
Capital Cost: *$1,830,000*
Annual Costs: *$40,000*

Alternative 4: Source Area and Source Soil Removal, and In-situ Chemical Oxidation

This alternative includes the lint trap source soils removal and ISCO injections specified in Alternative 3, but removes and disposes of all source soils exceeding the protection of groundwater SCOs from the MNR property. It also replaces active groundwater extraction with the installation of passive perimeter ISCO cylinders to treat contaminated groundwater before leaving the site.

A pre-design investigation will be similar to that described for Alternative 3 but without the groundwater extraction system pre-design elements and with the addition of a pilot test for the permanganate ISCO cylinders.

Lint trap source wastes/soils will be removed as described above in Alternative 3.

Contaminated soils exceeding the residential and protection of groundwater SCOs will be excavated from the adjacent MNR property and disposed off-site. The total estimated volume of soil to be removed is 1,300 cubic yards (CY) ranging in depth from 2 to 10 feet. A portion of the excavation is located under asphalt that will require removal prior to excavation. Areas will be backfilled to pre-existing grades with materials suitable for the site use as a railroad and railroad right of way and meeting residential and protection of groundwater SCOs.

ISCO injections will be implemented as described above in Alternate 3.

A perimeter passive ISCO treatment system will be installed at the site to treat contaminated groundwater before leaving the site. This will involve the installation of slow-release paraffin permanganate cylinders in two offset rows, spaced approximately 15 feet apart. Within each row, cylinders will be placed 8 to 10 feet apart, with multiple cylinders stacked above one another at each location to treat groundwater within both the overburden and the highly weathered bedrock zones prior to off-site migration. It is estimated that half the cylinders will be completed as monitoring wells to enable replacement of cylinders as needed. Monitoring wells will also be placed downgradient to monitor effectiveness.

Alternative 4 utilizes Institutional Controls (ICs) to provide additional protection. The ICs include groundwater use and land use restrictions to prevent contact with any remaining contamination in soils and groundwater. A Site Management Plan (SMP) will be required to specify details of the ICs, and to provide for Operation, Management, and Maintenance (OM&M) of the Engineering Controls (ECs) in place on and off of thesite.

Present Worth: *$2,810,000*
Capital Cost: *$2,320,000*
Annual Costs: *$16,400*

Alternative 5: Source Area and Source Soil Removal, In Situ Thermal Treatment

This alternative includes the lint trap source soils removal and the source soil excavation on the MNR property as specified in Alternative 4, but in lieu of active and passive ISCO treatment, an in situ thermal treatment (ISTT) system would be installed to address contaminants in soils and groundwater at the site and on the impacted MNR property.

Lint trap source soils will be removed as described above in Alternatives 3 and 4.

MNR property source soils will be removed as described in Alternative 4.

ISTT consists of electrical resistivity heating electrodes co-located with vapor recovery wells. Electrodes and vapor recovery wells would be installed on 15 feet spacing throughout the treatment area. The average depth of electrodes would be from 4.5 feet below ground surface (bgs) to the bottom of the highly weathered bedrock at approximately 25 feet bgs. Utility upgrades, off-gas treatment system, and a liquid effluent treatment system would also be installed. Confirmatory soil and groundwater samples would be collected before the system is dismantled. It is assumed that the system would remain in place at the site for operation and post-operation monitoring activities for at least one year.

Alternative 5 utilizes Institutional Controls (ICs) to provide additional protection. The ICs include groundwater use and land use restrictions to prevent contact with any remaining contamination in soils and groundwater A Site Management Plan (SMP) will be required to specify details of the ICs, and to provide for Operation, Management, and Maintenance (OM&M) and monitoring of the Engineering Controls (ECs) in place on and off of the site.

Present Worth: ..... *$ 5,630,000*
Capital Cost: ..... *$ 5,460,000*
Annual Costs: ..... *$ 5,700*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
Alternative 2: Restoration to Pre-Disposal or Unrestricted Conditions	18,900,000	0	18,900,000
Alternative 3: Source Area Removal, MNR Limited Excavation and Soil Cover, Source Area ISCO injections, and Perimeter Groundwater Extraction System	1,830,000	40,000	3,030,000
Alternative 4: Source soil Excavation at MNR, Source Area Removal, Source Area ISCO Injections, Perimeter ISCO cylinders	2,320,000	16,400	2,810,000
Alternative 5: Source soil Excavation at MNR, Source Area Removal, In Situ Thermal Treatment	5,460,000	5,700	5,630,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Source Area Excavation, and In-situ Chemical Oxidation as the remedy for this site. Alternative 4 would achieve the remediation goals for the site by removing sources of contamination, treating groundwater and residual soil contamination with ISCO, and treating contaminated groundwater leaving the site. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 10.

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

Alternative 1 (No Further Action) does not provide any additional protection to public health and the environment and thus will not be evaluated further.

The proposed remedy Alternative 4 would satisfy this criterion by removing the contaminated soils that are the source of the groundwater contamination plume, thereby addressing the most significant threat to public health and the environment. Contamination in exposed soils will be addressed on the adjacent MNR property thereby providing protection of public health by reducing exposure. Alternative 2, by removing all contaminated soil and treating groundwater, meets the threshold criteria with a high degree of certainty. Alternative 3 also complies with this criterion because it removes one source area and treats groundwater. But because it only partially removes and fully covers another source area, it meets this criterion to a lesser degree. Alternative 5 complies as it removes both sources of contamination and treats both groundwater and soils. Alternatives 2 through 5 protect human health from contaminated groundwater and soil vapor with ICs and ECs.

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.

All the retained Alternatives 2 through 5 comply with SCGs. Alternative 2 complies with this criterion to the highest degree of certainty by removing all soils above soil cleanup objectives (SCOs) on the site and on the adjacent MNR property. By removing sources and by treating much of the groundwater during dewatering activities, groundwater will naturally attenuate through natural biotic and abiotic degradation. Alternative 3 also complies with this criterion, and the groundwater extraction, treatment, and recirculation system in combination with ISCO injections would meet SCGs in a shorter time period than other alternatives. Proposed Alternative 4 meets this criterion by treating groundwater, although the active and passive ISCO treatment would take longer to bring groundwater to SCGs than Alternatives 2 and 5. Alternative 4 also relies on an existing site cover system

to limit exposure to a small area of soils not meeting SCOs. While Alternative 5 treats groundwater and also utilizes an existing site cover system, it meets this criterion to a slightly higher degree by treating groundwater and soils under the existing soil cover system using a technology which would take less time to achieve SCGs.

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 Alternative 2 as all contaminated soils and highly weathered bedrock will be removed to the depth of competent bedrock and disposed off-site, thereby removing the potential for further groundwater contamination. RAOs will be achieved in a short period of time and the remedy will be permanent. Long-term effectiveness is next best accomplished but to a lesser degree by Alternative 5. While both Alternatives 4 and 5 remove contaminated source soils and remove contaminant mass in groundwater through treatment technologies, Alternative 5 also addresses the small area of on-site contaminated soils underneath the existing cover system through thermal treatment as well, thereby making it slightly more effective and permanent in the long-term. Alternative 4 leaves behind the small amount of contaminated soil under the existing cover system which requires periodic inspections to ensure effectiveness, and may require maintenance to maintain long-term effectiveness and permanence. While Alternatives 2, 3, 4 and 5 require groundwater use restrictions until groundwater RAOs are achieved, the restriction for Alternative 2 is expected to be short term due to the removal of all sources of groundwater contamination. Similarly, Alternative 5 will likely take less time to achieve groundwater SCGs through thermal treatment as compared to ISCO technologies. Alternative 3 is a similarly effective long-term and permanent remedy as Alternative 4. Alternative 3 leaves a larger mass of contaminated soil under a cover system, but it also relies on a more robust engineering control (groundwater extraction, treatment, and recirculation system) to reduce the contaminant loading to the groundwater. While this EC requires regular maintenance for effective operation over a long period, it will eventually be effective and permanent. The potential for soil vapor intrusion over the long-term is expected to be reduced through the treatment and attenuation of groundwater contamination for all alternatives.

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.

Alternatives 3 and 4 will reduce toxicity, mobility, and volume of contaminants through a combination of excavation and off-site disposal, and treatment of soils and groundwater. Excavated soils will reduce toxicity and mobility of contaminants on-site by transferring the material to an approved off-site facility, and the volume of contaminated material would be reduced, depending on treatment or disposal options at the facility. ISCO groundwater treatment will reduce the toxicity and volume of contaminants within the plume. Alternative 3 may slightly better reduce the toxicity and volume of contaminants in groundwater than Alternative 4 as the groundwater treatment in Alternative 3 is active extraction and treatment vs an in situ chemical oxidation remedy, but Alternative 3 may take longer to do so effectively.

Alternative 2 provides the greatest reduction in toxicity and mobility of contaminants through excavation of and dewatering of all contaminated soils to bedrock and disposing contaminated soils off-site. Unless soils are treated at the approved off-site facility, the volume of contaminated soils will not be reduced. The excavation will be dewatered and all water generated will be treated and disposed, thereby reducing the volume of groundwater

contamination. Only Alternative 5 would permanently reduce the toxicity, mobility, and volume of contaminants by use of thermal treatment in soils and in groundwater.

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 2 through 5 all have short-term impacts associated with their activities. Each alternative involves some degree of intrusive activities which may temporarily disrupt the surrounding commercial and residential community via noise, odor, and increased truck traffic. These may be minimized with careful coordination with the municipality and surrounding landowners during remedial design. A community air monitoring plan (CAMP) and health and safety plan (HASP) would be necessary during remediation activities for each of the retained Alternatives.

Alternative 2 would have the greatest short term impacts with business disruption, building demolition, and the greatest amount of soils and groundwater to be removed. Alternative 3 involves the least amount of soil removal but it also involves capping an area of exposed soils on the MNR property, as well as setting up a large groundwater extraction and treatment system which would take up some space on the site and remain in operation for many years, thereby making short-term effectiveness lower than the other alternatives. Therefore, Alternative 3 rates just below Alternative 2 in greatest short-term impacts and lowest in short-term effectiveness. Alternative 4 rates lower than Alternative 3 in short-term impacts with source removal and excavation on the MNR property. However, the passive ISCO groundwater treatment does not have as much short-term impact but does take longer to be effective. Finally, Alternative 5 involves the same amount of excavation as Alternative 4, but short-term effectiveness is greater than Alternative 4 as thermal treatment is projected to take only 1-2 months to meet SCGs.

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.

The easiest alternative to implement is Alternative 4, followed by Alternative 5, which involves more set up including the possibility of having to do electrical service upgrades. Alternative 5 may also involve intensive monitoring during treatment duration to ensure vapors generated from the thermal treatment are captured and do not enter the building. Alternative 3 is more difficult to implement as it requires setting up a large groundwater treatment, extraction, and recirculation system, and actively monitoring and maintaining the system in the long-term. Alternative 2 is the most difficult to implement because it involves tearing down the on-site occupied building and employing properly designed staging, shoring, and dewatering, as well as the possibility of temporary closure of the railroad tracks behind the building. The administrative feasibility of installing a site cover and obtaining an institutional control from MNR may be difficult under Alternative 3.

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.

There is a large range of costs associated with the retained alternatives. The cost to implement Alternative 2,

cleanup to pre-release conditions, is significant and at least three times the cost of the next most costly alternative (Alternative 5). Alternative 5's thermal treatment is quite costly in implementation and in energy costs, but long term costs, consisting generally of infrequent monitoring and IC certification, are very low. The capital cost of Alternative 5 is at least double that of Alternatives 3 and 4 which are similar. Alternative 3 is more costly to implement and is more costly on an annual basis than proposed Alternative 4 which is the lowest in cost.

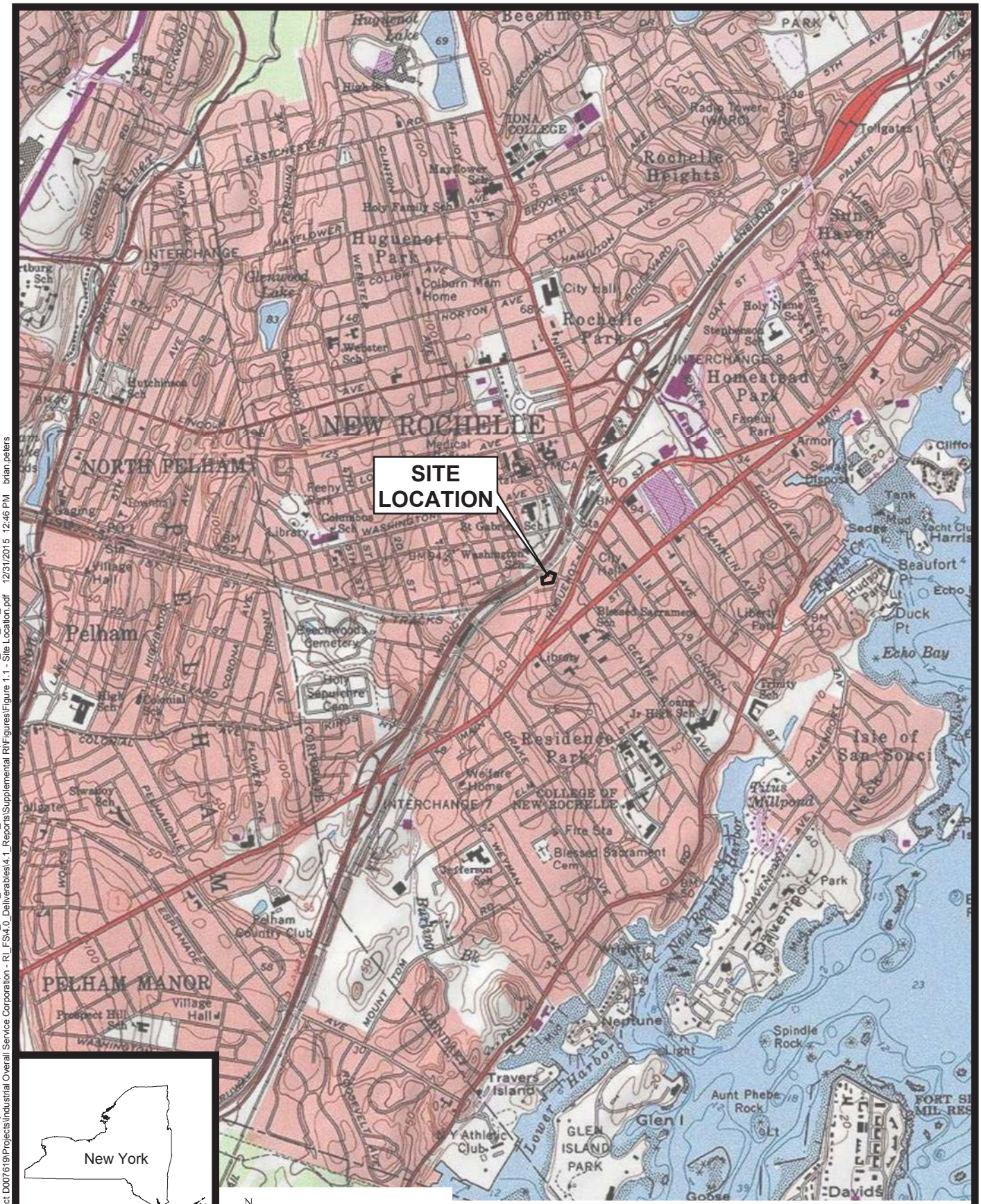
8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

Alternatives 2, 4, and 5 are compatible with foreseeable land use. While Alternative 2 would require demolition of the on-site building, it would presumably leave no contamination behind so the site will be unrestricted for any use compatible with local zoning. Contamination left behind in Alternative 4 would require a Site Management Plan (SMP) and restriction to commercial use, which will not interfere with the current land use of the site. Alternative 3 would also require a SMP and land use restriction for the site, but in order for the soil cover on the off-site MNR property to remain effective in controlling exposures, Institutional Controls must be employed which is not generally feasible for off-site parcels.

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 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.



NYSDEC SITE No: 360109
INDUSTRIAL OVERALL SERVICES
NEW ROCHELLE, NEW YORK

MACTEC

SITE LOCATION

Project 3612112221 Figure 1

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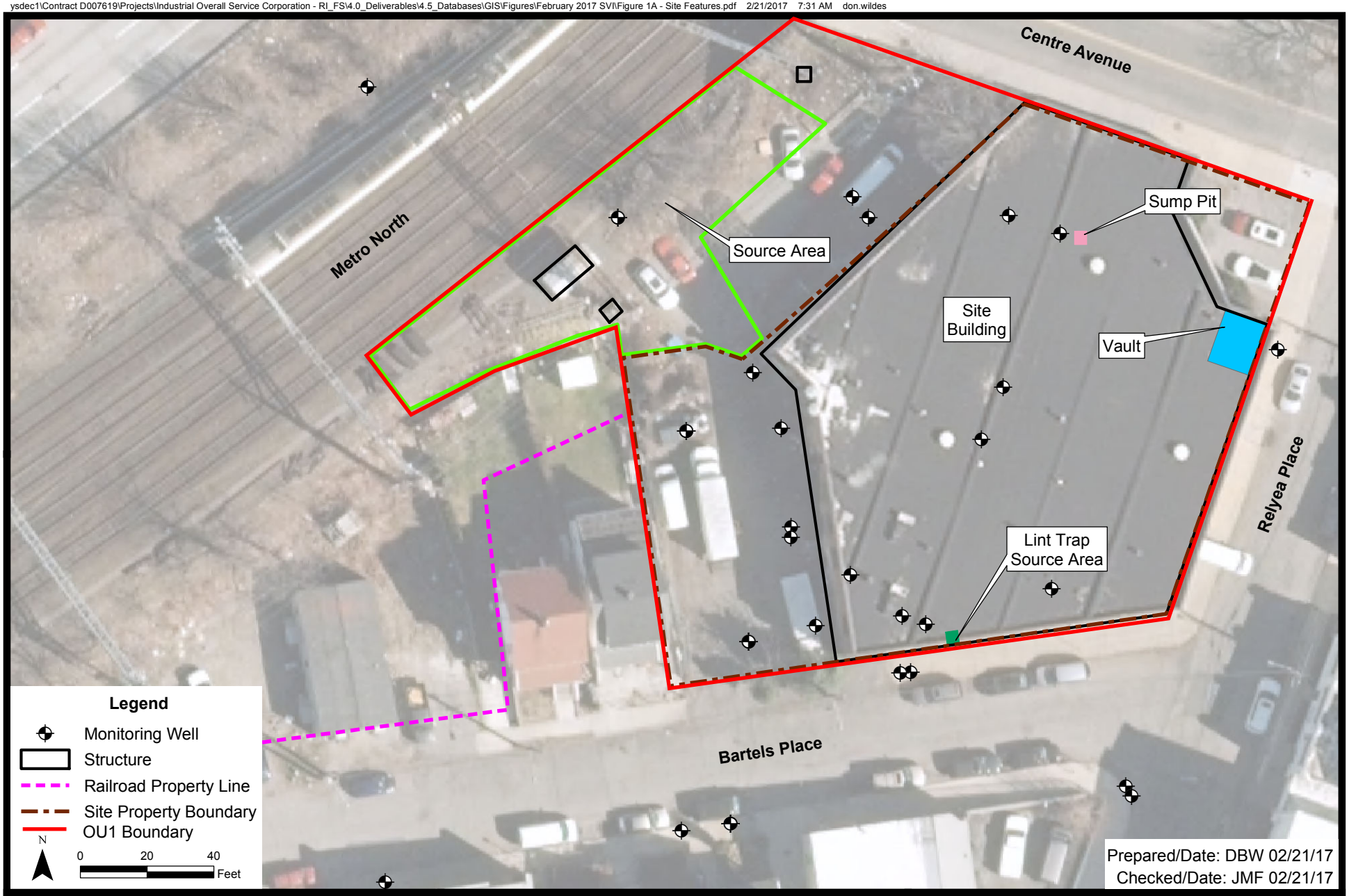

Prepared/Date: DBW 02/21/17
Checked/Date: JMF 02/21/17

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MACTEC

Site Features

Figure 1A

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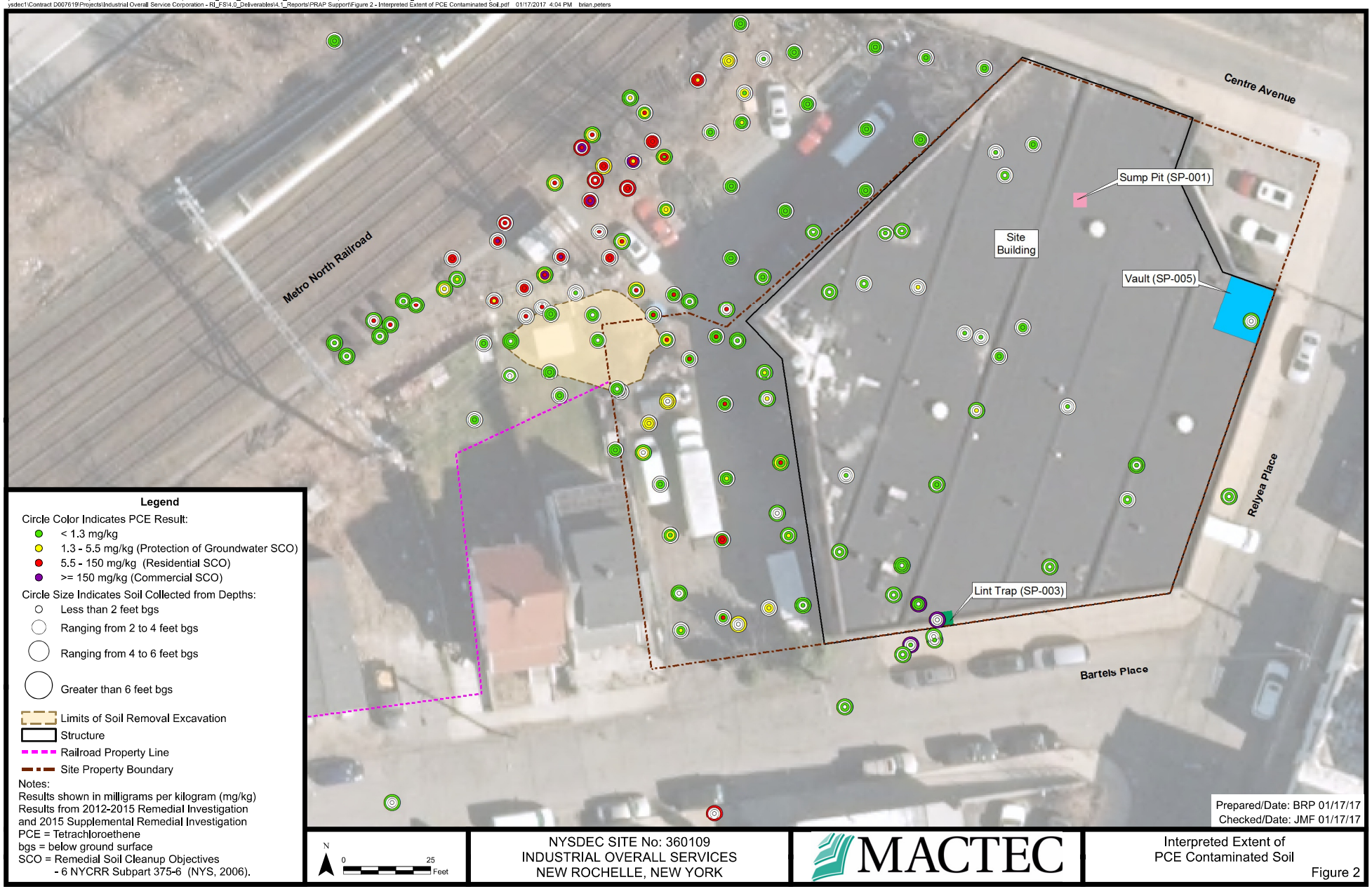
ysdec1\Contract D007619\Projects\Industrial Overall Service Corporation - RI_FS\4.0_Deliverables\4.1_Reports\PRAP Support\Figure 2 - Interpreted Extent of PCE Contaminated Soil.pdf 01/17/2017 4:04 PM brian.peters



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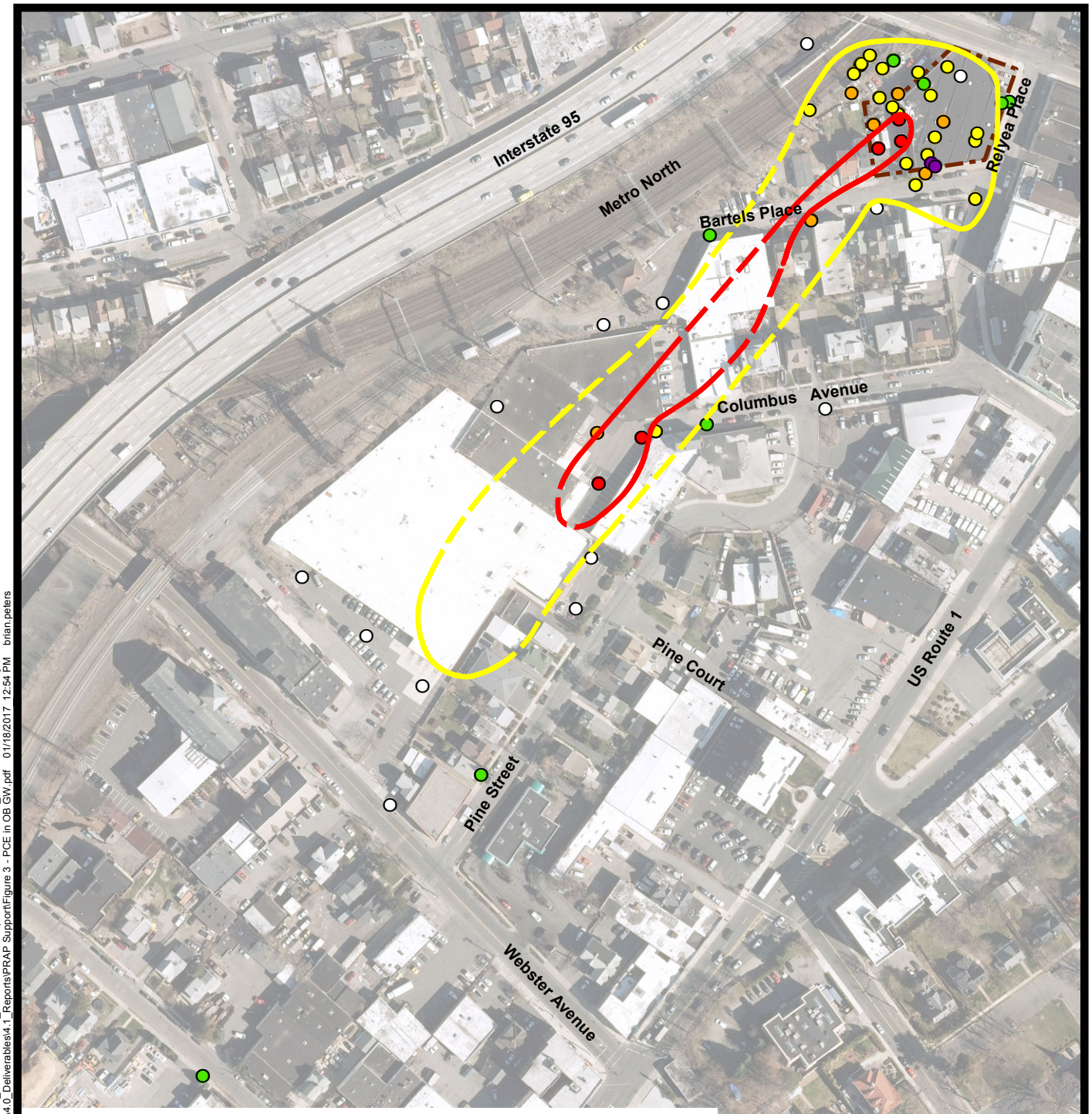
Interpreted Extent of
PCE Contaminated Soil
Figure 2



Legend

PCE in Groundwater:
- < 5 µg/L
- 5 - 100 µg/L
- 100 - 1,000 µg/L
- 1,000 - 10,000 µg/L
- > 10,000 µg/L
- Non-Detect

- Interpreted Area of PCE Detected in Groundwater at Concentrations exceeding 1,000 µg/L
- Interpreted Area of PCE Detected in Groundwater at Concentrations exceeding 5 µg/L
- Site Boundary

PCE = Tetrachloroethene

Results Shown in µg/L from 2012-2015

µg/L = micrograms per Liter

0 100 200 Feet

N

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Interpreted Extent of PCE Contamination in Overburden Groundwater

Figure 3

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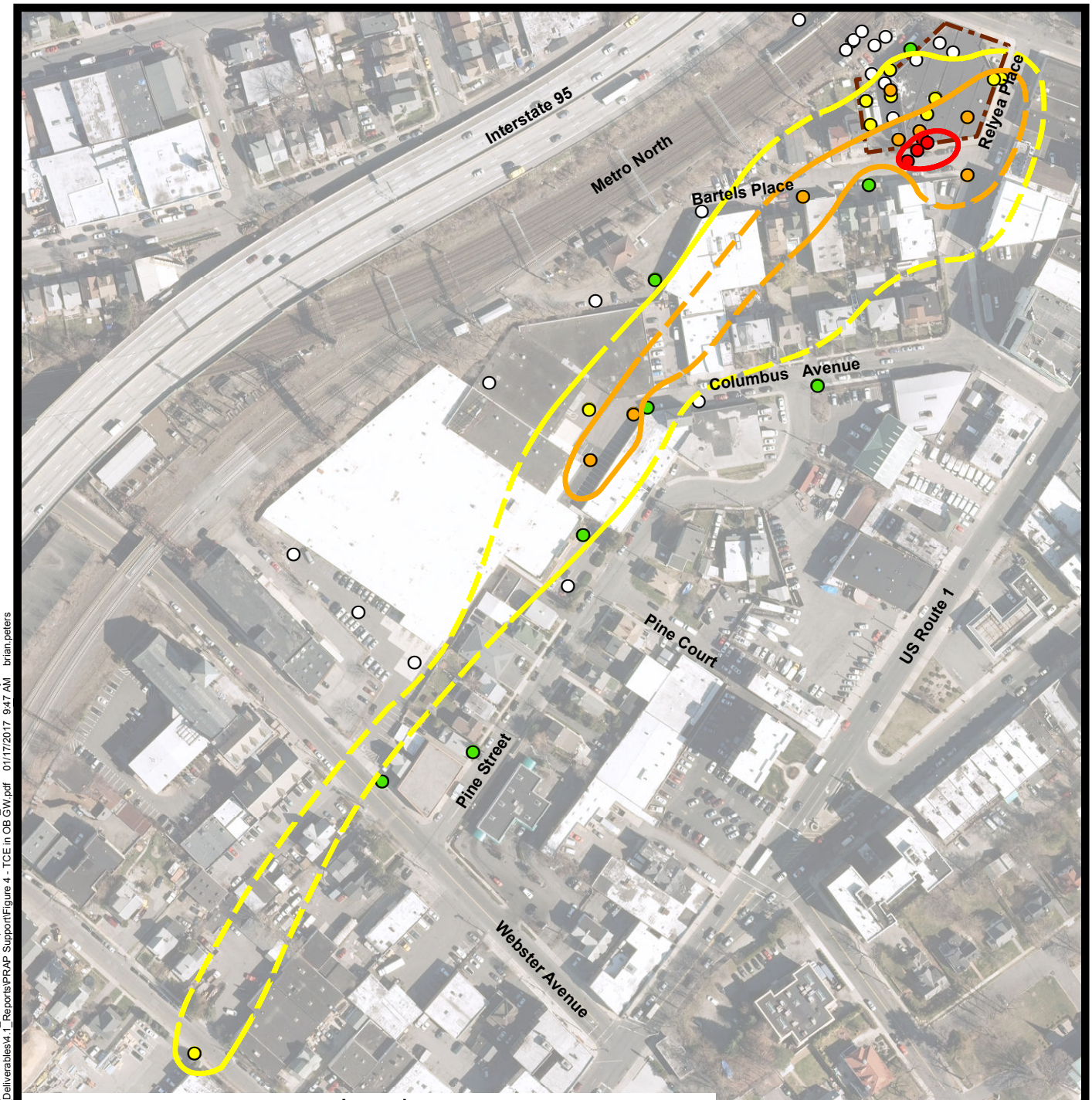
ysdec1\Contract D007619\Projects\Industrial Overall Service Corporation - RI_FS\4.0_Deliverables\4.1_Reports\PRAP Support\Figure 3 - PCE in OB GW.pdf 01/18/2017 12:54 PM brian.peters



Legend

TCE in Groundwater:

- < 5 µg/L
- 5 - 100 µg/L
- 100 - 1,000 µg/L
- > 1,000 µg/L
- Non-Detect

- Interpreted Area of TCE Detected in Groundwater at Concentrations exceeding 1,000 µg/L
- Interpreted Area of TCE Detected in Groundwater at Concentrations exceeding 100 µg/L
- Interpreted Area of TCE Detected in Groundwater at Concentrations exceeding 5 µg/L
- Site Boundary

TCE = Trichloroethene

Results Shown in µg/L from 2012-2015

µg/L = micrograms per Liter

0 100 200 Feet

N

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Interpreted Extent of TCE Contamination in Overburden Groundwater

Figure 4

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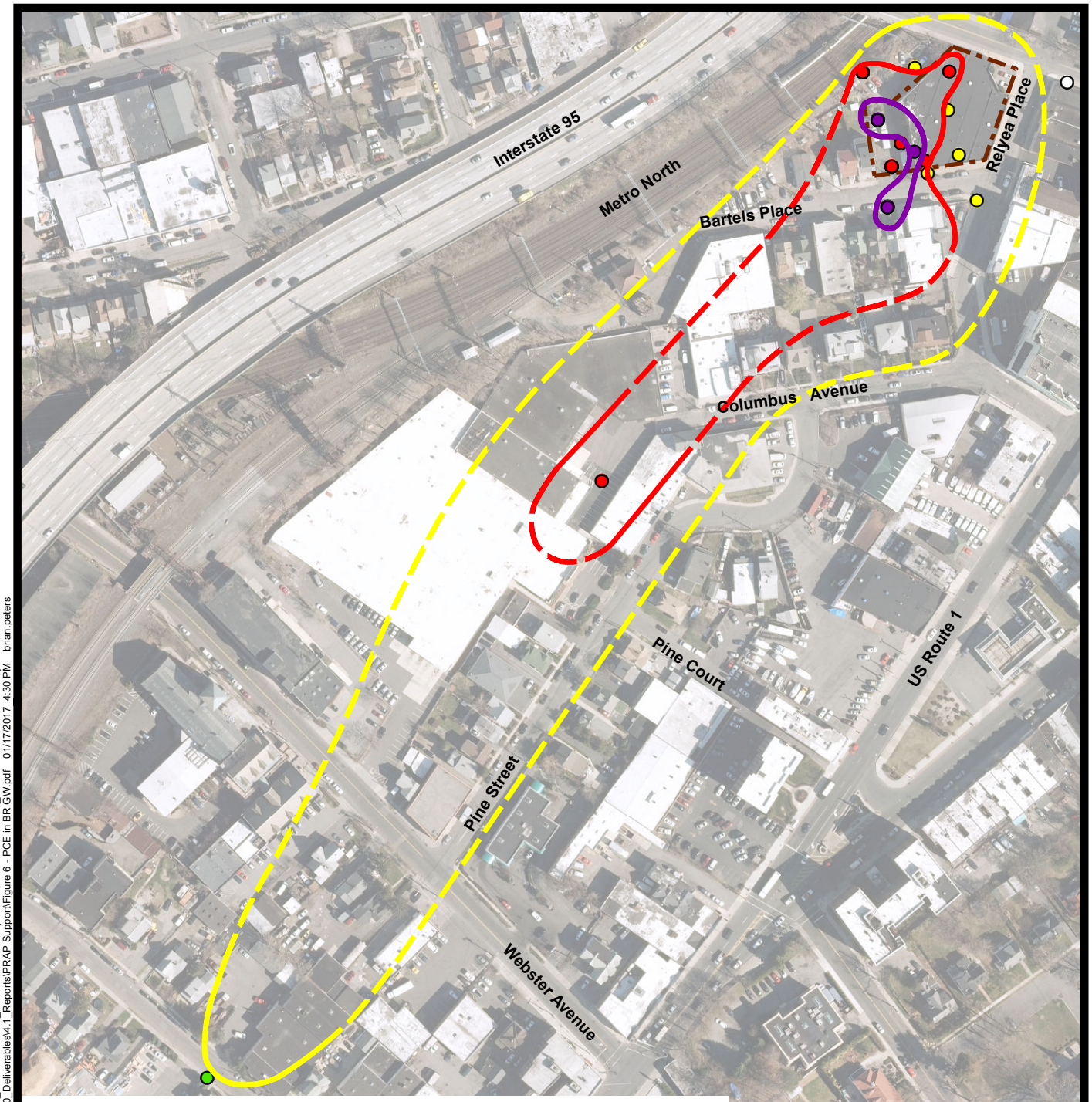

Legend

PCE in Groundwater:
- < 5 µg/L
- 5 - 100 µg/L
- 100 - 1,000 µg/L
- 1,000 - 10,000 µg/L
- > 10,000 µg/L
- Non-Detect

Interpreted Area of PCE Detected in Groundwater at Concentrations exceeding 10,000 µg/L

Interpreted Area of PCE Detected in Groundwater at Concentrations exceeding 1,000 µg/L

Interpreted Area of PCE Detected in Groundwater at Concentrations exceeding 5 µg/L

Site Boundary

PCE = Tetrachloroethene

Results Shown in µg/L from 2012-2015

µg/L = micrograms per Liter

0 100 200 Feet

N

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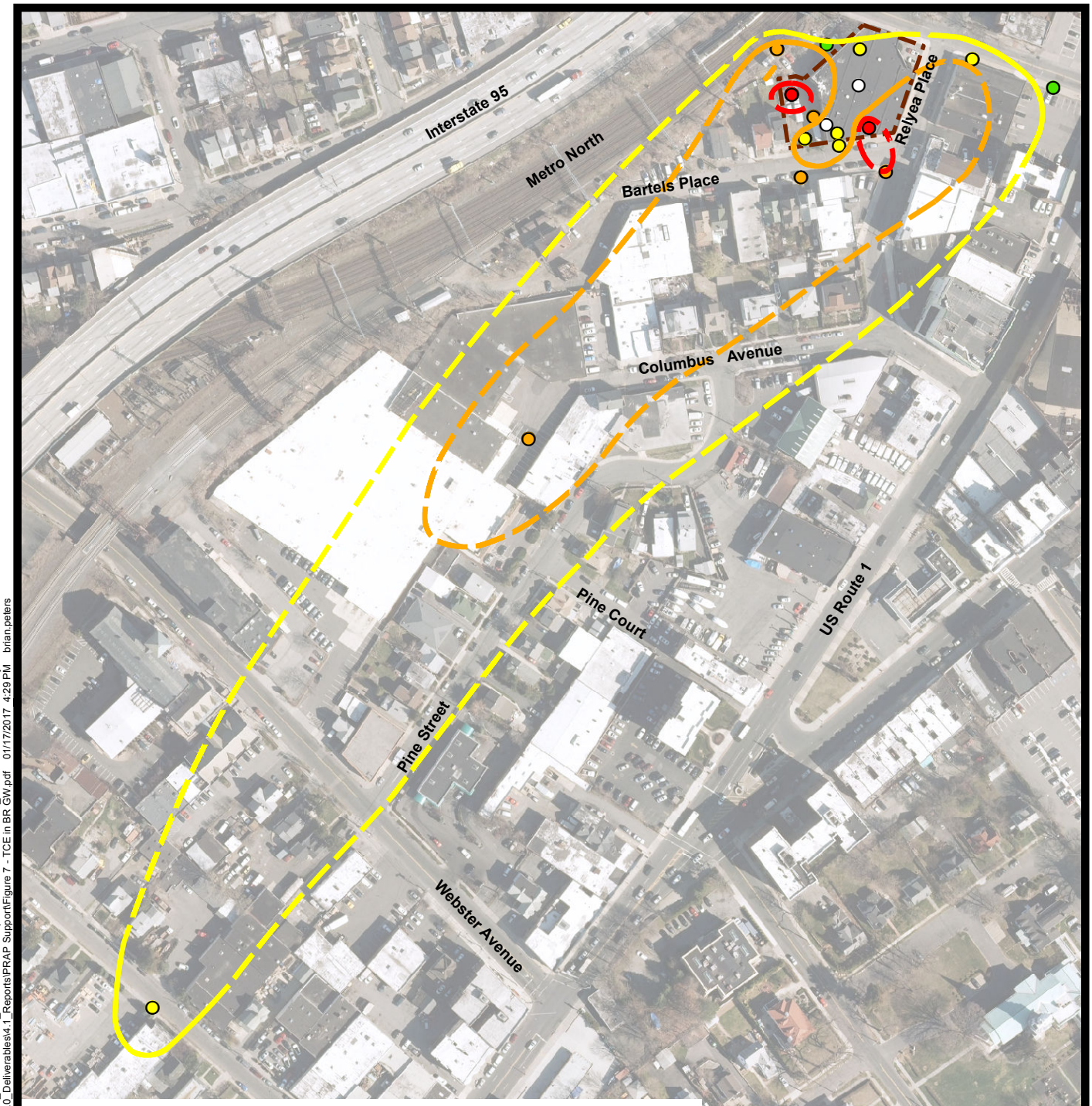
Interpreted Extent of PCE Contamination in Bedrock Groundwater

Figure 5



Legend

TCE in Groundwater:
- < 5 µg/L
- 5 - 100 µg/L
- 100 - 1,000 µg/L
- > 1,000 µg/L
- Non-Detect

Interpreted Area of TCE Detected in Groundwater at Concentrations exceeding 1,000 µg/L

Interpreted Area of TCE Detected in Groundwater at Concentrations exceeding 100 µg/L

Interpreted Area of TCE Detected in Groundwater at Concentrations exceeding 5 µg/L

Site Boundary

TCE = Trichloroethene

Results Shown in µg/L from 2012-2015

µg/L = micrograms per Liter

0 105 210 Feet

N

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Interpreted Extent of TCE Contamination in Bedrock Groundwater

Figure 6

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ysdec1\Contract D007619\Projects\Industrial Overall Service Corporation - RI_FS\4.0_Deliverables\4.1_Reports\PRAP Support\Figure 7 - TCE in BR GW.pdf 01/17/2017 4:29 PM brian.peters

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