DECISION DOCUMENT

112-21 Northern Boulevard
Brownfield Cleanup Program
Corona, Queens County
Site No. C241157
January 2015

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

DECLARATION STATEMENT - DECISION DOCUMENT

112-21 Northern Boulevard
Brownfield Cleanup Program
Corona, Queens County
Site No. C241157
January 2015

Statement of Purpose and Basis

This document presents the remedy for the 112-21 Northern Boulevard site, a brownfield cleanup site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the 112-21 Northern Boulevard site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the 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 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 that 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. In-Situ Chemical Oxidation

An in-situ chemical oxidation groundwater treatment will be implemented prior to excavation. In-situ chemical oxidation (ISCO) will be implemented to treat contaminants in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 21,600-square foot area located in the northwestern area of the site where Volatile Organic Compounds were elevated in groundwater. ISCO will be implemented via approximately 37 injection wells. The approximate locations of the proposed injection points are shown on Figure 2. The remedial goal of the groundwater remedy is to achieve a bulk reduction in groundwater contamination to asymptotic levels.

3. Excavation

All on-site soils which exceed unrestricted use soil cleanup objectives (SCOs), as defined by 6 NYCRR Part 375-6.8, will be excavated and transported off-site for disposal. Based on the remedial investigation, it is estimated that approximately 25,000 cubic yards of soil will be removed from the site. The extent of the soil excavation will be determined based on confirmatory soil samples collected during excavation. The depth of the excavation will extend approximately 5 feet into the water table along the northwestern portion of the site where groundwater contamination was encountered (hot spot excavation). Dewatering of the excavation will be necessary. Any groundwater or water pumped from the excavation will be treated on-site, as necessary, prior to discharge to the NYC sewer system, however if on-site treatment is not feasible, contaminated water will be transported for off-site disposal at a permitted facility.

If unrestricted SCOs can't be achieved, at a minimum the upper two feet of soils must meet the restricted residential SCOs and all on site soils which exceed the applicable groundwater protection SCOs will be excavated and transported off-site for disposal (see Contingent Remedial Elements below).

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

The intent of the above remedial elements is to achieve Track 1 unrestricted use; therefore, no environmental easement (EE) or site management plan (SMP) is anticipated. No groundwater use restriction is needed because the area is served by public water and Article 141 of the NYCDOH code prohibits potable use of groundwater without prior approval. If a sub-grade parking garage is constructed beneath the entire on-site future building(s), then the soil vapor intrusion pathway will be adequately addressed by the New York City Mechanical Code, which requires proper ventilation. If the building does not include sub-grade parking beneath the entire structure or the soil vapor intrusion (SVI) evaluation has not been completed prior to completion of the Final Engineering Report (FER), then a SMP and an EE will be required to address the SVI evaluation and mitigate the building as needed; if a mitigation system is needed a Track 1 cleanup can only be achieved if the mitigation system can be shut down within 5 years.

In the event that Track 1 unrestricted use is not achieved, including achievement of unrestricted SCOs, groundwater and/or soil vapor remedial action objectives, the following contingent

remedial elements will be required.

Contingent Remedial Elements:

4. Cover System

In the event that an unrestricted use SCOs are not achieved a site cover will be required to allow for restricted residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

5. Institutional Controls

In the event that a Track 1 unrestricted use cleanup is not achieved, including achievement of groundwater and soil vapor remedial goals, imposition of an institutional control in the form of an environmental easement may be required for the controlled property that:

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

6. Site Management Plan

In the event that a Track 1 unrestricted use cleanup is not achieved, including achievement of groundwater and soil vapor remedial goals, a Site Management Plan may be required, which would include the following:

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

Institutional Controls: The environmental easement discussed in Paragraph 5 above.

Engineering Controls: The cover system discussed in Paragraph 4 above.

This plan includes, but may not be limited to:

o an Excavation Plan which details the provisions for management of future excavations in

areas of remaining contamination;
o descriptions of the provisions of the environmental easement including any land use, and/or groundwater and/or surface water use restrictions;
o 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;
o provisions for the management and inspection of the identified engineering controls;
o maintaining site access controls and Department notification; and
o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

o monitoring of groundwater and soil vapor to assess the performance and effectiveness of the remedy;
o a schedule of monitoring and frequency of submittals to the Department;
o monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

Declaration

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

January 20, 2015

Date

Robert Cozzy, Director
Remedial Bureau B

DECISION DOCUMENT

112-21 Northern Boulevard
Corona, Queens County
Site No. C241157
January 2015

SECTION 1: SUMMARY AND PURPOSE

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

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

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

SECTION 2: CITIZEN PARTICIPATION

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

Queens Public Library-Corona Branch
Attn: Vilma Daza
38-23 104 Street
Corona, NY 11368
Phone: 718-426-2844

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

Site Location: The 1.6 acre BCP site is located at 112-21 Northern Boulevard in Corona, Queens County and is currently vacant. The site lies along the north side of Northern Boulevard between 112th Place and Astoria Boulevard (144th Street). Two one-story buildings are located on the southeast and northwest corners of the site which were formerly used as automobile repair shops. The two-story building located on the southwest corner of the site was formerly used as an auto parts distribution warehouse, showroom and offices.

Current Zoning and Land Use: According to the New York City Zoning Map, the property is a R6 (residential) with a C2-4 (commercial) overlay zoning district. Currently, the property is unoccupied. The surrounding area is a mix of residential and commercial properties.

Past Use of the Site: A gasoline filling station operated on this site between 1931 and 1980. The site also operated as a glass factory, automobile sales showroom, commercial office, and automobile repair facility.

Site Geology and Hydrogeology: The surface of the site is approximately 40 feet above mean sea level in the southwest corner of the property. Regional topography slopes to the northeast toward Flushing Bay, which is located approximately 900 feet northeast of the site. Groundwater is approximately 30-40 feet below ground surface and flows to the northeast.

The site is underlain with fine to coarse grained sand with gravel. Bedrock underlying this area was not encountered.

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, an alternative which allows for unrestricted use of the site was evaluated.

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

SECTION 5: ENFORCEMENT STATUS

The Applicant(s) under the Brownfield Cleanup Agreement is a/are Volunteer(s). The

Applicant(s) does/do not have an obligation to address off-site contamination. However, the Department has determined that this site does not pose a significant threat to public health or the environment; accordingly, no enforcement actions are necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

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

The analytical data collected on this site includes data for:

- groundwater
- soil
- soil vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant

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

cis-1,2-Dichloroethene	NICKEL
XYLENE (MIXED)	NAPHTHALENE
CADMIUM	TETRACHLOROETHYLENE (PCE)
LEAD	1,2,4-TRIMETHYLBENZENE
CHROMIUM	TOLUENE
COPPER	CHLORDANE
ZINC	

The contaminant(s) of concern 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 Decision Document.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

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

Based on investigations previously conducted at the site, the primary contaminants of concern are petroleum compounds related to a previous on-site spill or release. Portions of the site historically operated as a retail gas station, auto repair shop and auto show-room.

Nature and Extent of Contamination:

The environmental impacts appear localized in the vicinity of the former waste oil underground storage tank (UST) and the staining observed in the northwest corner of the 112th Place automobile repair facility. This property has one open Spill (#1308653).

Soil:

During the remedial investigation of the site, 18 borings were installed and 19 soil samples collected. Of the 19 soil samples collected, one sample had exceedances of volatile organic compounds (VOCs) above unrestricted use Soil Cleanup Objectives (SCOs) but below residential use SCOs. 1,2,4-trimethylbenzene was detected at 3.8 parts per million (ppm) and total xylenes at 1.4 ppm. No semi-volatile organic compounds (SVOCs) were detected above unrestricted use SCOs. The following metals were detected above unrestricted use SCOs but below residential use SCOs: chromium; copper; lead; nickel and zinc. Cadmium was detected above restricted-residential use SCOs at 4.9 ppm. No polychlorinated biphenyls (PCBs) or pesticides were detected above unrestricted use SCOs.

Groundwater:

During the remedial investigation, 12 groundwater samples were collected. Petroleum-related VOCs and chlorinated-VOCs were detected above groundwater standards. For example, total xylenes was detected at 280 ppb, toluene at 88 ppb, 1,2,4-trimethylbenzene at 61 ppb, cis-1,2-dichloroethene at 200 ppb and tetrachloroethene at 28 ppb. Naphthalene was the only SVOC detected above groundwater standards at 11 ppb. No PCBs were detected in any groundwater samples. Chlordane was the only pesticide detected above groundwater standards at 0.506 ppb.

Light non-aqueous phase liquid (LNAPL) was detected at a thickness of up to 0.25 feet; LNAPL is often associated with the presence of petroleum related compounds. Multiple monitoring wells were installed in the northwestern portion of the site where LNAPL was suspected. LNAPL is present in one monitoring well (MW-11); the Department considers the extent of LNAPL well defined.

Soil Vapor:

Eight soil vapor samples were installed and sampled during the remedial investigation. The soil vapor samples were co-located with soil borings and monitoring wells to avoid potential data gaps. Petroleum-related compounds were detected; the highest concentration was toluene at 42.2 micrograms per cubic meter (ug/m3). The chlorinated-VOC tetrachloroethene was detected at a maximum concentration of 208 ug/m3.

Based on the available data, it is not anticipated that contamination has migrated off-site in any environmental media.

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 drinking contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. People will not come into contact with the contaminated soil unless they dig below the asphalt cap which currently exists at the site. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within

the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The site is currently vacant so soil vapor intrusion is not a current concern. Sampling indicates that soil vapor intrusion is not a concern for off-site properties.

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.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set

forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 1: Unrestricted use remedy.

The selected remedy is referred to as the In-Situ Groundwater Treatment and Soil Excavation remedy.

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

1. Remedial Design

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

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If unrestricted SCOs can't be achieved, at a minimum the upper two feet of soils must meet the restricted residential SCOs and all on site soils which exceed the applicable groundwater protection SCOs will be excavated and transported off-site for disposal (see Contingent Remedial Elements below).

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

The intent of the above remedial elements is to achieve Track 1 unrestricted use; therefore, no environmental easement (EE) or site management plan (SMP) is anticipated. No groundwater use restriction is needed because the area is served by public water and Article 141 of the NYCDOH code prohibits potable use of groundwater without prior approval. If a sub-grade parking garage is constructed beneath the entire on-site future building(s), then the soil vapor intrusion pathway will be adequately addressed by the New York City Mechanical Code, which requires proper ventilation. If the building does not include sub-grade parking beneath the entire structure or the soil vapor intrusion (SVI) evaluation has not been completed prior to completion of the Final Engineering Report (FER), then a SMP and an EE will be required to address the SVI evaluation and mitigate the building as needed; if a mitigation system is needed a Track 1 cleanup can only be achieved if the mitigation system can be shut down within 5 years.

In the event that Track 1 unrestricted use is not achieved, including achievement of unrestricted SCOs, groundwater and/or soil vapor remedial action objectives, the following contingent remedial elements will be required.

Contingent Remedial Elements:

4. Cover System

In the event that an unrestricted use SCOs are not achieved a site cover will be required to allow for restricted residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of two feet of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for restricted residential use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

5. Institutional Controls

In the event that a Track 1 unrestricted use cleanup is not achieved, including achievement of groundwater and soil vapor remedial goals, imposition of an institutional control in the form of an environmental easement may be required for the controlled property that:

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

6. Site Management Plan

In the event that a Track 1 unrestricted use cleanup is not achieved, including achievement of groundwater and soil vapor remedial goals, a Site Management Plan may be required, which would include the following:

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

Institutional Controls: The environmental easement discussed in Paragraph 5 above.

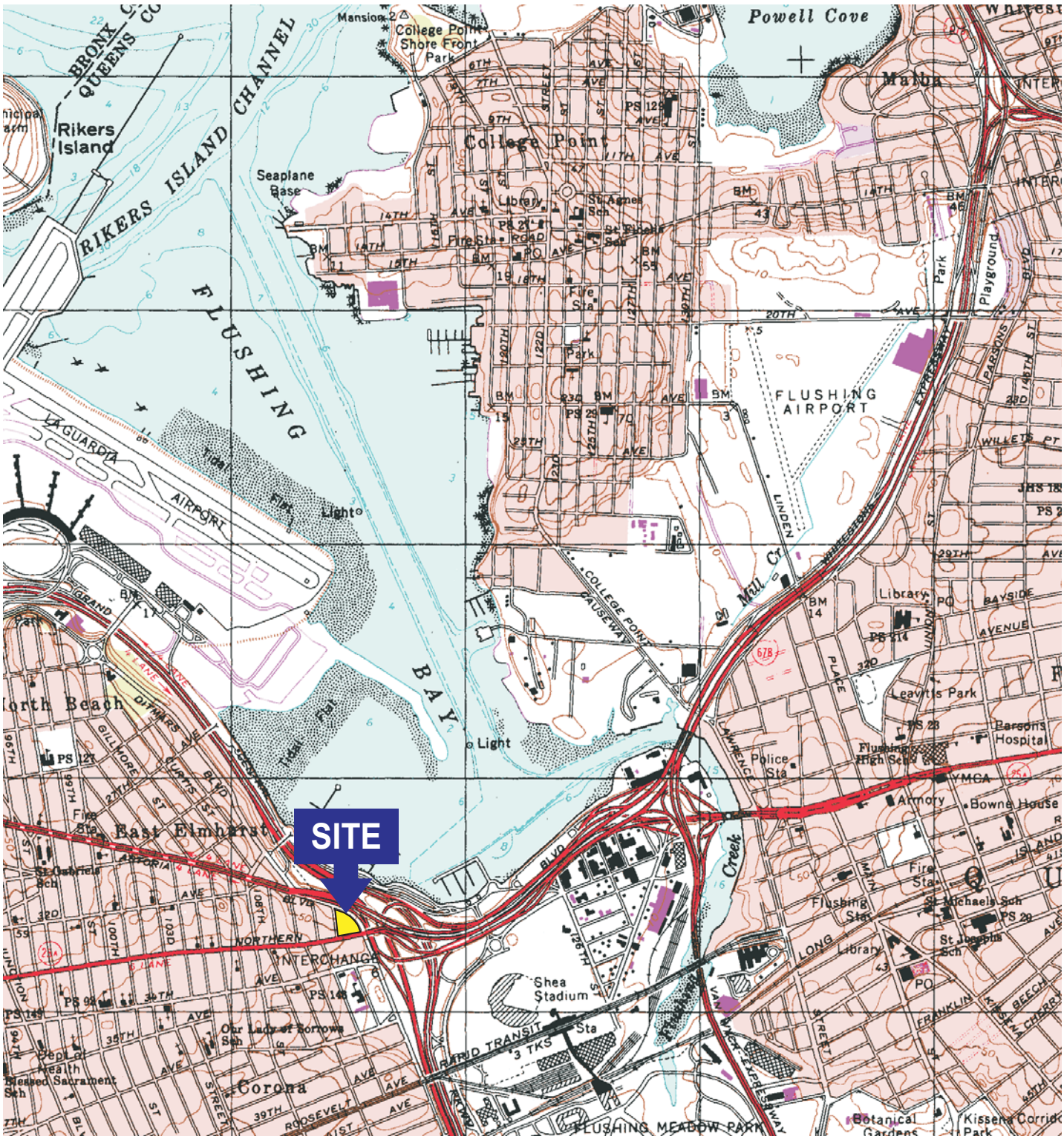
Engineering Controls: The cover system discussed in Paragraph 4 above.

This plan includes, but may not be limited to:

o an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
o descriptions of the provisions of the environmental easement including any land use, and/or groundwater and/or surface water use restrictions;
o 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;
o provisions for the management and inspection of the identified engineering controls;
o maintaining site access controls and Department notification; and
o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

o monitoring of groundwater and soil vapor to assess the performance and effectiveness of the remedy;
o a schedule of monitoring and frequency of submittals to the Department;
o monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.



QUADRANGLE LOCATION

SOURCE:
USGS; 1995, FLUSHING, NY
7.5 Minute Topographic Quadrangle

N

0 2000'

Title:

SITE LOCATION MAP

112-21 NORTHERN BOULEVARD
CORONA, NEW YORK

Prepared for:

EASTERN EMERALD GROUP LLC

ROUX

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: J.W.	Date: 23DEC13	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	1
Project Mgr.: C.B.	Project No.: 2364.0001Y000	
File: 2364.0001Y100.01.CDR		

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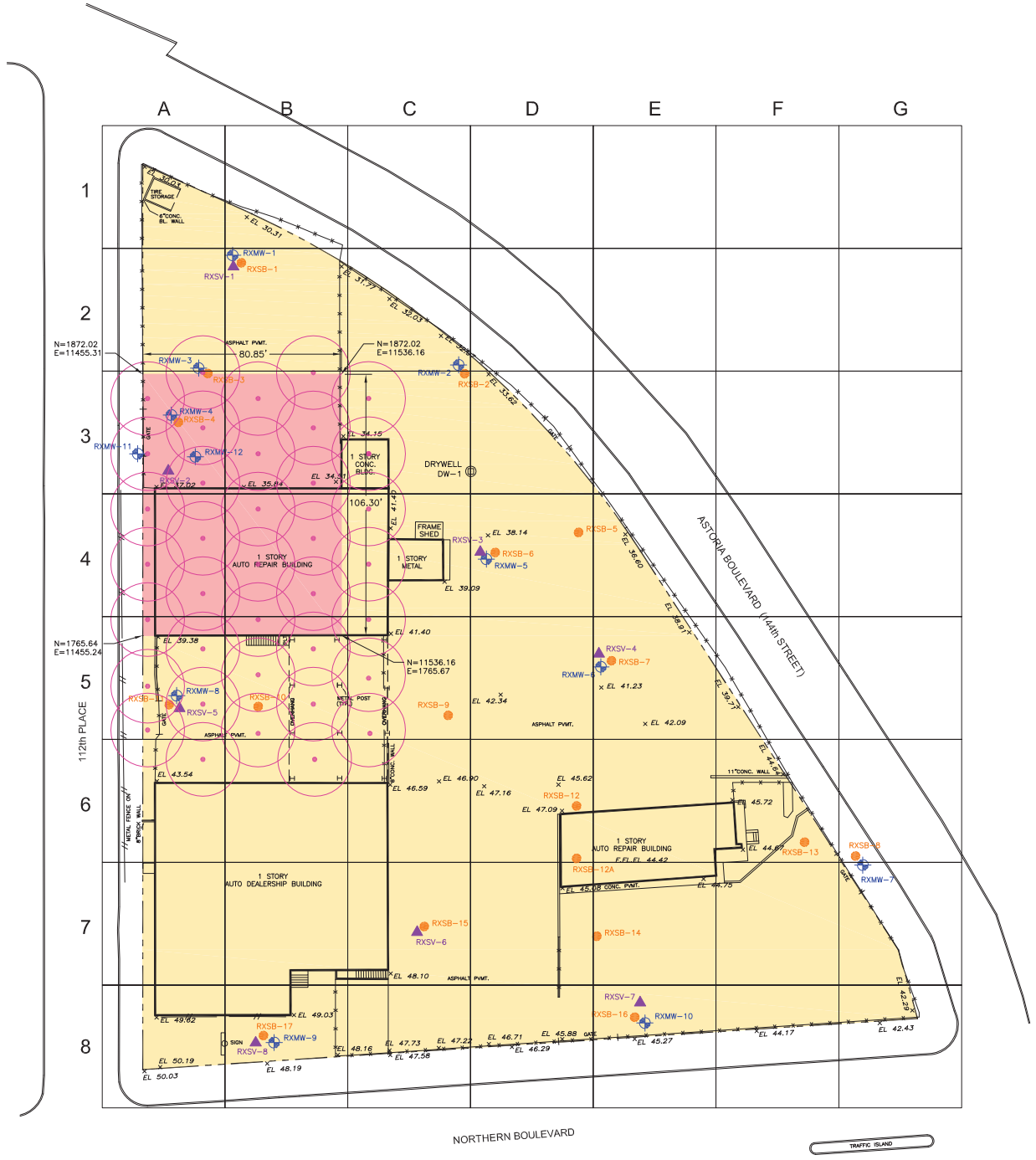


LEGEND

RXSB-1 LOCATION AND DESIGNATION OF SOIL BORING

RXMW-1 LOCATION AND DESIGNATION OF MONITORING WELL

RXSV-1 LOCATION AND DESIGNATION OF SOIL VAPOR SAMPLE

Site Boundary

INJECTION POINT

INJECTION POINT RADIUS OF INFLUENCE (15 FT)

EL 42.09 x EXISTING SPOT ELEVATION, IN FEET

PROPOSED EXCAVATION

PROPOSED HOT SPOT EXCAVATION

N

30' 0 30'

Title:

REMEDIAL ALTERNATIVE 1

REMEDIAL ACTION PLAN
112-21 NORTHERN BOULEVARD
SITE NO. C241157

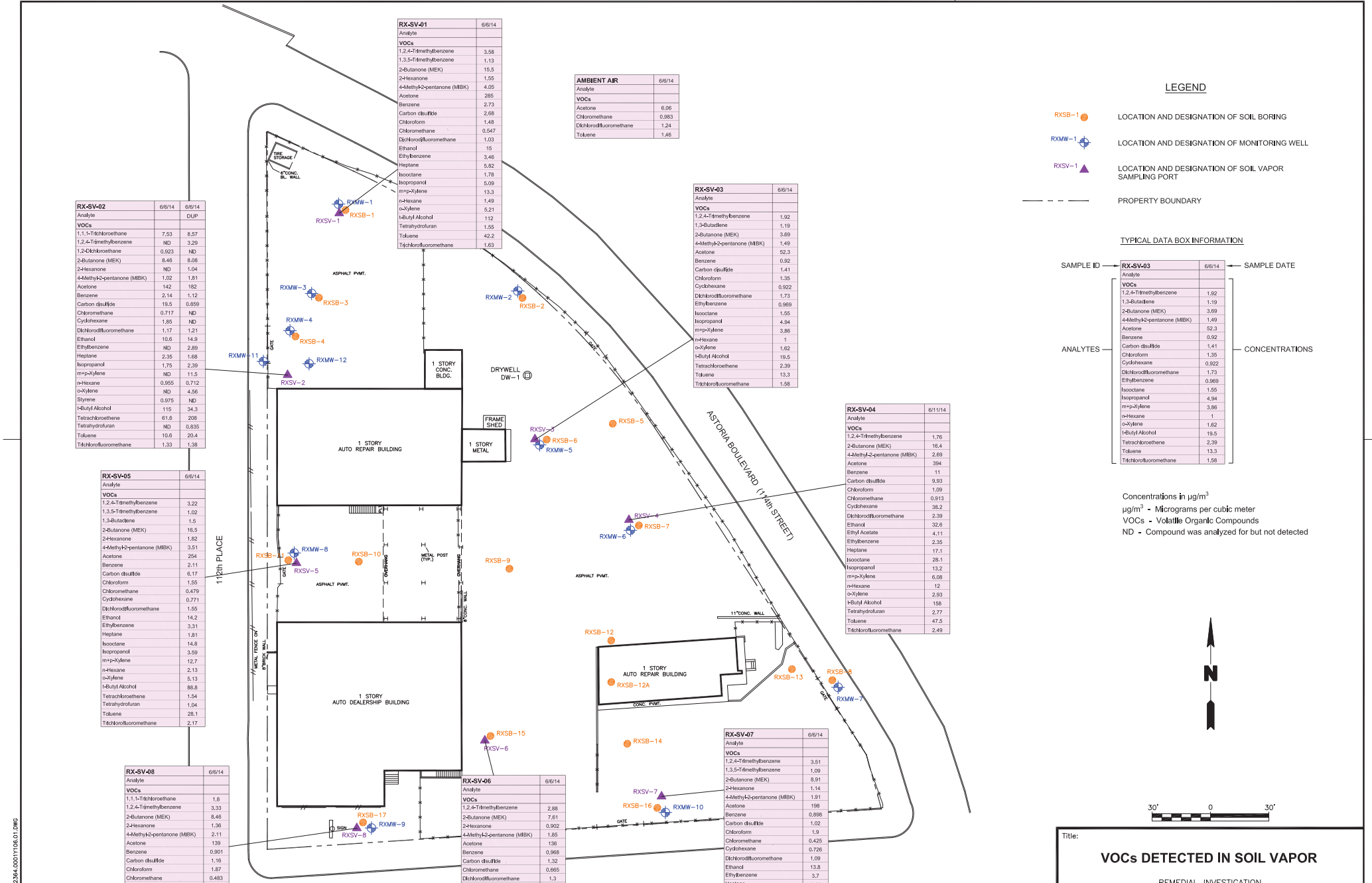
Prepared For:

EASTERN EMERALD GROUP LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: C.B.	Date: 18JUL14
Prepared by: J.A.D.	Scale: AS SHOWN
Project Mgr: C.B.	Project: 2364.0001Y000
File: 2364.0001Y107.02-.DWG	

2



LEGEND

RXSB–1 — LOCATION AND DESIGNATION OF SOIL BORING

RXMW–1 — LOCATION AND DESIGNATION OF MONITORING WELL

RXSV–1 — LOCATION AND DESIGNATION OF SOIL VAPOR SAMPLING PORT

PROPERTY BOUNDARY

TYPICAL DATA BOX INFORMATION

SAMPLE ID → RX-SV-03 | 6/6/14 ← SAMPLE DATE

Analyte |
VOCs |
1,2,4-Trimethylbenzene 1.92
1,3-Butadiene 1.19
2-Butanone (MEK) 3.69
4-Methyl-2-pentanone (MIBK) 1.49
Acetone 52.3
Benzene 0.92
Carbon disulfide 1.41
Chloroform 1.35
Cyclohexane 0.922
Dichlorodifluoromethane 1.73
Ethylbenzene 0.969
Isooctane 1.55
Isopropanol 4.94
m+p-Xylene 3.86
n-Hexane 1
o-Xylene 1.62
t-Butyl Alcohol 19.5
Tetrachloroethene 2.39
Toluene 13.3
Trichlorofluoromethane 1.58

ANALYTES — CONCENTRATIONS

Concentrations in µg/m^3

µg/m^3 - Micrograms per cubic meter

VOCs - Volatile Organic Compounds

ND - Compound was analyzed for but not detected

Title:

VOCs DETECTED IN SOIL VAPOR

REMEDIAL INVESTIGATION
112–21 NORTHERN BOULEVARD
SITE NO. C241157

Prepared For:
EASTERN EMERALD GROUP LLC

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: C.B.	Date: 02JUL14	PLATE
Prepared by: B.H.C.	Scale: AS SHOWN	3
Project Mgr: C.B.	Project: 2364.0001Y000	
File: 2364.0001Y106.01.DWG		

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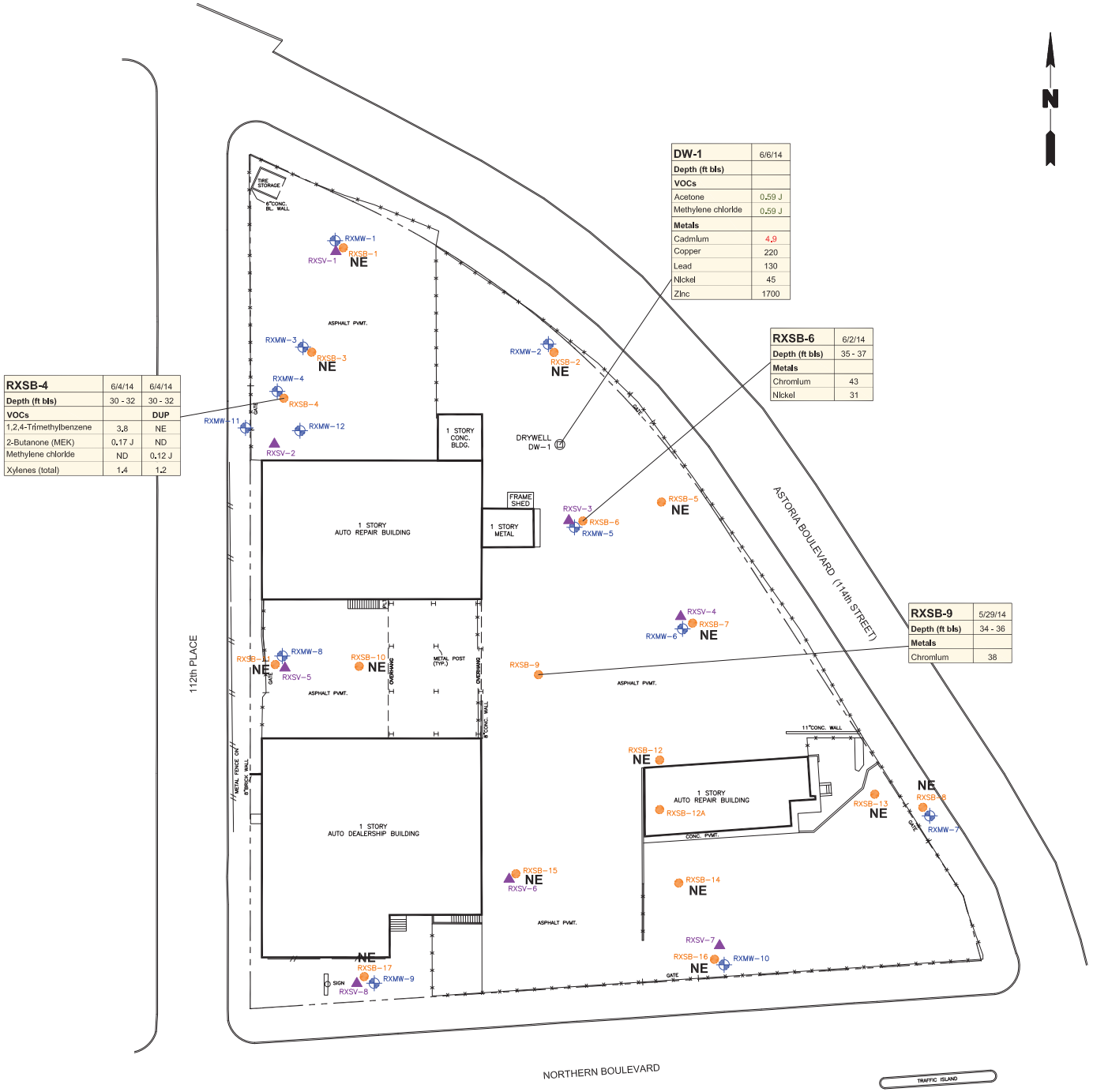

Concentrations in µg/kg
µg/kg - Micrograms per kilogram
* - NYSDEC Part 375 Unrestricted Use Standards
** - NYSDEC Part 375 Restricted Residential Standards
NYSDEC - New York State Department of Environmental Conservation
-- - Not detected above NYSDEC CP-51 Contaminated Soil Cleanup Levels
J - Estimated value
DUP - Duplicate Sample
VOCs - Volatile Organic Compounds
NE - No exceedance
ND - No detection
NA - Not analyzed for by laboratory
ft bls - Feet below land surface

Parameter	Standards* (mg/kg)	Standards** (mg/kg)
VOCs		
1,2,4-Trimethylbenzene	3.6	52
2-Butanone (MEK)	0.12	100
Acetone	0.05	100
Methylene chloride	0.05	100
Xylenes (total)	0.26	100
Metals		
Cadmium	3	4
Chromium	30	180
Copper	50	270
Lead	63	400
Nickel	30	310
Zinc	109	10000

Title:
SOIL DETECTIONS IN EXCESS OF NYSDEC SUBPART 375-6 SOIL CLEANUP OBJECTIVES

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Prepared by: B.H.C.	Scale: AS SHOWN	4
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File: 2364.0001Y106.01.DWG		

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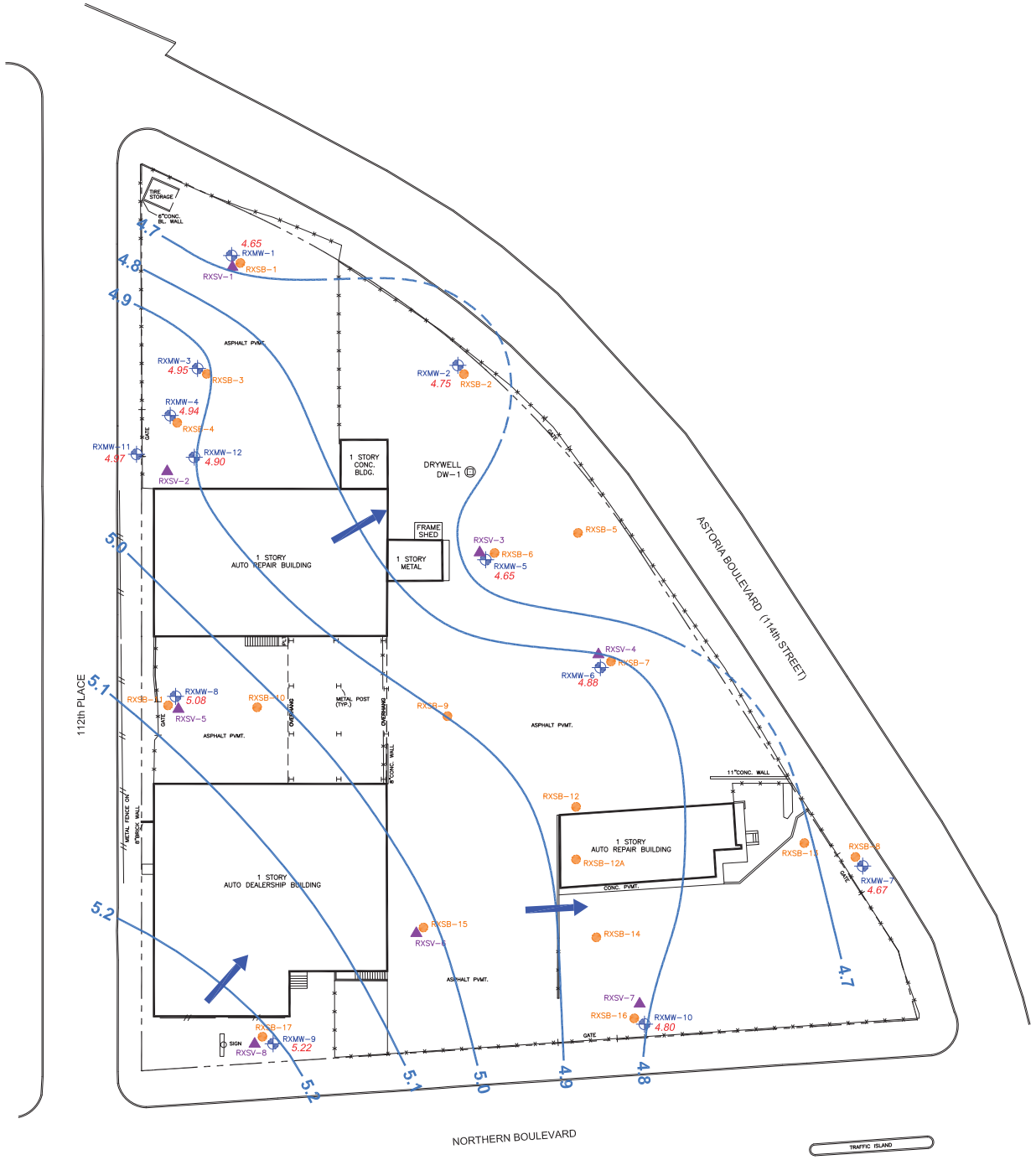

LEGEND

- RXSB-1 — LOCATION AND DESIGNATION OF SOIL BORING
- RXMW-1 — LOCATION AND DESIGNATION OF MONITORING WELL
- RXSV-1 — LOCATION AND DESIGNATION OF SOIL VAPOR SAMPLING PORT
- PROPERTY BOUNDARY
- 4.67 — WATER-TABLE ELEVATION, IN FEET RELATIVE TO MEAN SEA LEVEL
- 5.0 — LINE OF EQUAL WATER-TABLE ELEVATION, IN FEET RELATIVE TO MEAN SEA LEVEL (DASHED WHERE INFERRED)
- INFERRED DIRECTION OF GROUNDWATER FLOW

N

30' 0 30'

Title:

WATER-TABLE ELEVATIONS JUNE 18, 2014

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Compiled by: C.B.	Date: 02JUL14	PLATE 5
Prepared by: B.H.C.	Scale: AS SHOWN	
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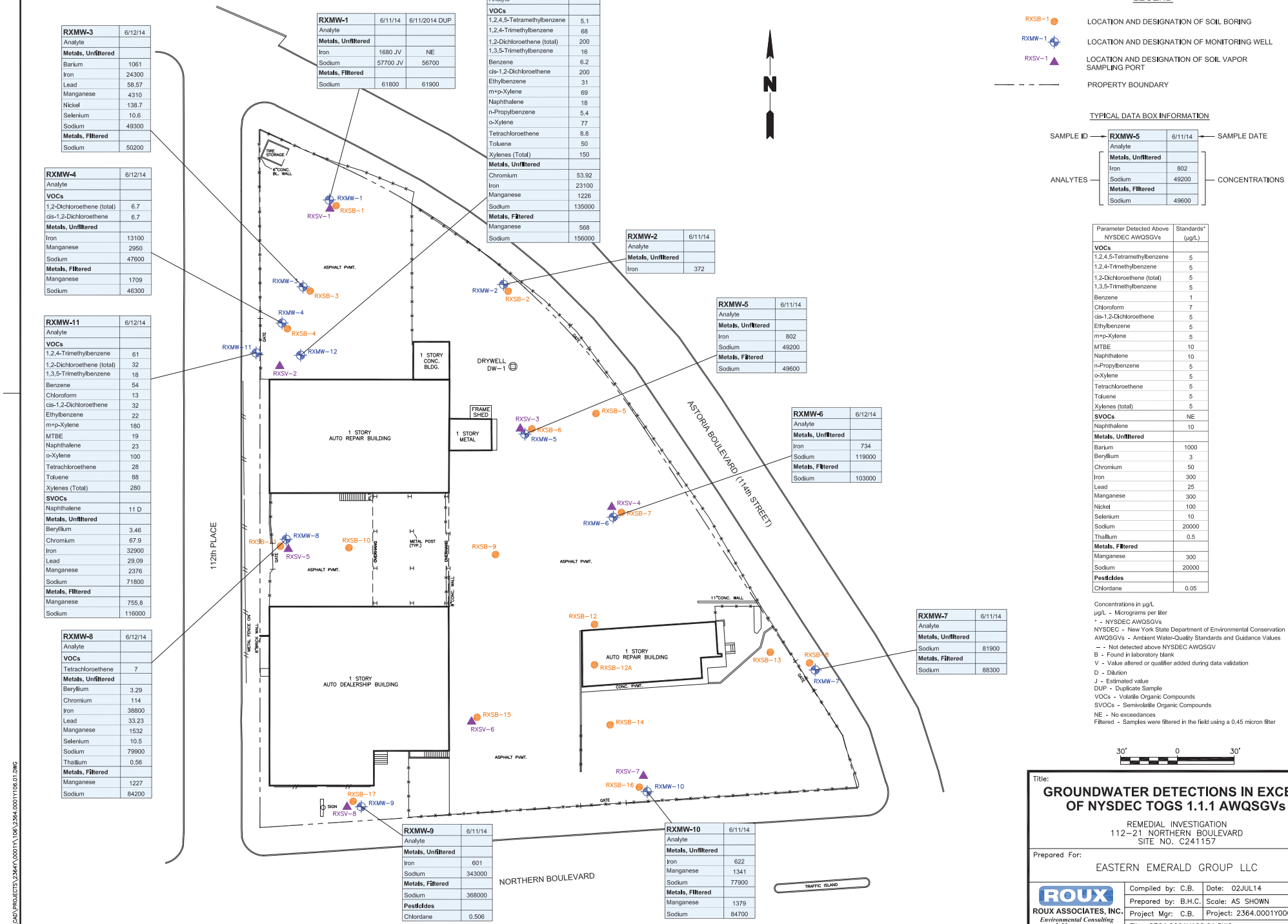

RXMW-1	6/11/14	6/11/2014 DUP
Analyte		
Metals, Unfiltered		
Iron	1680 JV	NE
Sodium	57700 JV	56700
Metals, Filtered		
Sodium	61800	61900

RXMW-12	6/12/14
Analyte	
VOCs	
1,2,4,5-Tetramethylbenzene	5.1
1,2,4-Trimethylbenzene	68
1,2-Dichloroethene (total)	200
1,3,5-Trimethylbenzene	16
Benzene	6.2
cis-1,2-Dichloroethene	200
Ethylbenzene	31
m+p-Xylene	69
Naphthalene	18
n-Propylbenzene	5.4
o-Xylene	77
Tetrachloroethene	8.8
Toluene	50
Xylenes (Total)	150
Metals, Unfiltered	
Chromium	53.92
Iron	23100
Manganese	1226
Sodium	135000
Metals, Filtered	
Manganese	568
Sodium	156000

RXMW-3	6/12/14
Analyte	
Metals, Unfiltered	
Barium	1061
Iron	24300
Lead	58.57
Manganese	4310
Nickel	138.7
Selenium	10.6
Sodium	49300
Metals, Filtered	
Sodium	50200

RXMW-2	6/11/14
Analyte	
Metals, Unfiltered	
Iron	372

RXMW-4	6/12/14
Analyte	
VOCs	
1,2-Dichloroethene (total)	6.7
cis-1,2-Dichloroethene	6.7
Metals, Unfiltered	
Iron	13100
Manganese	2950
Sodium	47600
Metals, Filtered	
Manganese	1709
Sodium	46300

RXMW-5	6/11/14
Analyte	
Metals, Unfiltered	
Iron	802
Sodium	49200
Metals, Filtered	
Sodium	49600

RXMW-11	6/12/14
Analyte	
VOCs	
1,2,4-Trimethylbenzene	61
1,2-Dichloroethene (total)	32
1,3,5-Trimethylbenzene	18
Benzene	54
Chloroform	13
cis-1,2-Dichloroethene	32
Ethylbenzene	22
m+p-Xylene	180
MTBE	19
Naphthalene	23
o-Xylene	100
Tetrachloroethene	28
Toluene	88
Xylenes (Total)	280
SVOCs	
Naphthalene	11 D
Metals, Unfiltered	
Beryllium	3.46
Chromium	67.9
Iron	32900
Lead	29.09
Manganese	2376
Sodium	71800
Metals, Filtered	
Manganese	755.8
Sodium	116000

RXMW-6	6/12/14
Analyte	
Metals, Unfiltered	
Iron	734
Sodium	119000
Metals, Filtered	
Sodium	103000

RXMW-8	6/12/14
Analyte	
VOCs	
Tetrachloroethene	7
Metals, Unfiltered	
Beryllium	3.29
Chromium	114
Iron	38800
Lead	33.23
Manganese	1532
Selenium	10.5
Sodium	79900
Thallium	0.56
Metals, Filtered	
Manganese	1227
Sodium	84200

RXMW-7	6/11/14
Analyte	
Metals, Unfiltered	
Sodium	81900
Metals, Filtered	
Sodium	88300

RXMW-9	6/11/14
Analyte	
Metals, Unfiltered	
Iron	601
Sodium	343000
Metals, Filtered	
Sodium	368000
Pesticides	
Chlordane	0.506

RXMW-10	6/11/14
Analyte	
Metals, Unfiltered	
Iron	622
Manganese	1341
Sodium	77900
Metals, Filtered	
Manganese	1379
Sodium	84700

LEGEND

RXSB–1 — LOCATION AND DESIGNATION OF SOIL BORING

RXMW–1 — LOCATION AND DESIGNATION OF MONITORING WELL

RXSV–1 — LOCATION AND DESIGNATION OF SOIL VAPOR SAMPLING PORT

PROPERTY BOUNDARY

TYPICAL DATA BOX INFORMATION

SAMPLE ID → RXMW-5 | 6/11/14 ← SAMPLE DATE

RXMW-5	6/11/14
Analyte	
Metals, Unfiltered	
Iron	802
Sodium	49200
Metals, Filtered	
Sodium	49600

ANALYTES → CONCENTRATIONS

Parameter Detected Above NYSDEC AWQSGVs	Standards* (µg/L)
VOCs	
1,2,4,5-Tetramethylbenzene	5
1,2,4-Trimethylbenzene	5
1,2-Dichloroethene (total)	5
1,3,5-Trimethylbenzene	5
Benzene	1
Chloroform	7
cis-1,2-Dichloroethene	5
Ethylbenzene	5
m+p-Xylene	5
MTBE	10
Naphthalene	10
n-Propylbenzene	5
o-Xylene	5
Tetrachloroethene	5
Toluene	5
Xylenes (total)	5
SVOCs	NE
Naphthalene	10
Metals, Unfiltered	
Barium	1000
Beryllium	3
Chromium	50
Iron	300
Lead	25
Manganese	300
Nickel	100
Selenium	10
Sodium	20000
Thallium	0.5
Metals, Filtered	
Manganese	300
Sodium	20000
Pesticides	
Chlordane	0.05

Concentrations in µg/L
µg/L - Micrograms per liter
* - NYSDEC AWQSGVs
NYSDEC - New York State Department of Environmental Conservation
AWQSGVs - Ambient Water-Quality Standards and Guidance Values
– - Not detected above NYSDEC AWQSGV
B - Found in laboratory blank
V - Value altered or qualifier added during data validation
D - Dilution
J - Estimated value
DUP - Duplicate Sample
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
NE - No exceedances
Filtered - Samples were filtered in the field using a 0.45 micron filter

30' 0 30'

Title:

GROUNDWATER DETECTIONS IN EXCESS OF NYSDEC TOGS 1.1.1 AWQSGVs

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