REMEDIAL ACTION WORK PLAN
FORMER UNIONPORT WORKS SITE – OU-02
BRONX, NEW YORK
VCA NUMBER D2-003-02-08
SITE ID NO. V00553

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Certification Statement

I, Jason D. Brien, P.E. certify that I am currently a NYS registered professional engineer and that this *OU-2 Remedial Action Work Plan was prepared in accordance* with all applicable statutes and regulations and in substantial conformance with the DER *Technical Guidance for Site Investigation and Remediation* (DER-10).

_____ Date _____

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UNIONPORT GAS WORKS SITE – OU-2 REMEDIAL ACTION WORK PLAN

Bronx, New York

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ACRONYMS AND ABBREVIATIONS

AAR	Alternatives Analysis Report
amsl	above mean sea level
BG&E	Bronx Gas and Electric Company
BTEX	benzene, toluene, ethylbenzene, and xylene
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
COCs	constituents of concern
Con Edison	Consolidated Edison Company of New York, Inc.
DER	Division of Environmental Remediation
DNAPL	dense non-aqueous phase liquid
ECL	Environmental Conservation Law
EGP	electric generating plant
GEI	Consultants, Inc.
HASP	Health and Safety Plan
LNAPL	light non-aqueous phase liquid
mg/kg	milligrams per kilogram
MGP	manufactured gas plants
NAPL	non-aqueous phase liquid
NOAA	National Oceanic and Atmospheric Administration
NYCEDC	New York City Economic Development Corporation
NYCRR	New York Code of Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Standards
OU	Operational Unit
PAHs	polycyclic aromatic hydrocarbons
PPE	personal protective equipment
PRR	Periodic Review Report

RCRA	Resource Conservation and Recovery Act
RAOs	remedial action objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
SCGs	standards, criteria, and guidance
SCOs	soil cleanup objectives
SMP	site management plan
SVOCs	semi-volatile organic compounds
TOGS	Technical and Operational Guidance Series
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VOCs	volatile organic compounds

1 INTRODUCTION

This *Remedial Action Work Plan* (RAWP) presents the proposed remedial alternative to address environmental impacts identified for Operable Unit No. 2 (OU-2) of the Consolidated Edison Company of New York, Inc. (Con Edison) former Unionport Gas Works site (the site) located in the Borough of Bronx, New York, New York. The site is identified as New York State Department of Environmental Conservation (NYSDEC) Site No. V00553.

As indicated in the October 2014 *OU-2 Remedial Investigation Report* (RI Report) (Arcadis, 2014a), the site is divided into three operable units as follows:

- OU-1 consists of the former gas works area which is bordered by Watson Avenue to the north, Zerega Avenue to the west, Blackrock Avenue to the south, and Westchester Creek to the east.
- OU-2 includes the properties to the north of OU-1 including Watson Avenue. OU-2 is bordered by an undeveloped area to the north, Zerega Avenue to the west, OU-1 to the south, and Westchester Creek to the east
- OU-3 consists of Westchester Creek, located immediately east of OU-1 and OU-2.

Each of the above operable units represent a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release, or exposure pathway resulting from site impacts.

This RAWP focuses on OU-2 of the former Unionport Works site and does not include proposed remedial alternatives for OU-1, OU-3 or the Zerega Avenue gas holder site. Con Edison presented the proposed OU-1 remedial alternative in the NYSDEC-approved July 2014 *OU-1 Alternatives Analysis Report* (AAR) (Arcadis, 2014b). No remedial action is required for OU-3 at the site, as outlined in the *Westchester Creek Remedial Investigation Report* (Arcadis, 2013a).

1.1 Purpose

The primary objective of this RAWP is to present the recommended remedial alternative for OU-2 of the former Unionport Works site, which will address the site-related impacts identified in the RI Report and achieve the site-specific remedial action objectives (RAOs) (presented in Section 5).

This RAWP has been prepared by Arcadis of New York, Inc. (Arcadis) on behalf of Con Edison in accordance with the requirements of the 2002 Voluntary Cleanup Agreement (VCA) (Index #D2-0003-02-08) between Con Edison and NYSDEC. This RAWP has also been prepared in consideration of applicable provisions of the New York State Environmental Conservation Law (ECL) and associated regulations, including Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 375-6 (6 NYCRR Part 375-6), and NYSDEC's Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) (NYSDEC, 2010).

1.2 Document Organization

This RAWP is organized as presented in the following table.

Table 1.1 Document Organization

Section	Description
Section 1 – Introduction	Presents the purpose and organization of the RAWP.
Section 2 – Site Background	Provides an overview of the site location and physical setting and manufactured gas plant (MGP) site history and operation.
Section 3 – Characterization Summary	Presents a summary of the RI and the nature and extent of impacts at OU-2 of the former Unionport Works site.
Section 4 – Identification of Standards, Criteria, and Guidance	Identifies standards, criteria, and guidance (SCGs) that were used in the development of the proposed remedial alternative.
Section 5 – Remedial Action Objectives	Presents the site-specific RAOs that have been developed to be protective of public health and the environment.
Section 6 – Proposed Remedial Alternative	Presents a summary of the proposed remedial alternative to address the environmental concerns at the site, and an evaluation of the proposed remedial alternative against DER-10 evaluation criteria.
Section 7 – Schedule	Presents the anticipated project schedule for implementing the Proposed Remedial Alternative.
Section 8 – References	Presents a list of documents used to support the preparation of this RAWP.

2 SITE BACKGROUND

This section presents an overview of site background information, including site location and physical setting and MGP site history and operation.

2.1 Location and Physical Setting

The former Unionport Works site is located at 1066 Zerega Avenue in the Unionport section of Bronx, New York (Figure 1). As shown on Figure 2, OU-2 of the former Unionport Works site occupies an approximately 5.0-acre area bordered by undeveloped land to the north, Zerega Avenue to the west, OU-1 to the south, and Westchester Creek to the East. As shown on Figure 2, the former Zerega Avenue gas holder site is located on the west side of Zerega Avenue southwest of OU-2.

OU-2 current consists of the portion of Watson Avenue between Zerega Avenue and Westchester Creek, Sibling Fuel Oil (located at the northeast corner of the intersection of Zerega Avenue and Watson Avenue), and an equipment laydown/storage lot owned by the New York City Economic Development Corporation (NYCEDC) (located along the north side of Watson Avenue). Access to the portion of Watson Avenue within OU-2 is restricted by fencing. OU-1 is located to the south of OU-2 and is currently occupied by an inactive bulk petroleum storage terminal.

OU-2 is generally flat with an elevation of approximately 20 feet above mean sea level (amsl). However, an approximately 8-foot high stone embankment sloping toward Westchester Creek is located along Westchester Creek in the eastern portion of OU-2. As shown on Figure 2, above-grade structures within OU-2 include a large Garage/Office Buildings owned by Sibling Fuel Oil and a Warehouse located in the NYCEDC's equipment laydown/storage lot.

2.2 Site History and Operation

A detailed account of the site history and past site ownership for the former Unionport Works site is presented in the document entitled *Manufactured Gas Plant History: Unionport Works and Zerega Avenue Station* prepared by GEI Consultants, Inc. (GEI) (GEI, 2002). The information presented in the GEI document includes a review of available Sanborn Fire Insurance Maps, current and historical use of OU-1 and adjacent properties, and potential environmental issues associated with these current and historical activities. Specific historical information describing the industrial use of OU-2 is not available.

The former MGP operated at OU-1 of the site from circa 1905 to 1929, and primarily included the production of manufactured gas using the Lowe carbureted water gas process. Based on a review of available records, the MGP property ownership is as follows:

- 1893 to 1945 – Con Edison (or predecessor companies including the Bronx Gas and Electric Company [BG&E] and Consolidated Gas Company).
- 1945 to 1950 – Forsee Realty Corporation.
- 1950 to 2007 – Various petroleum companies including Combined Petroleum Transfer Corporation; Cirillo Brothers Petroleum Company; Cibro Terminal, Inc.; Morningside Fuel Corporation; and Twin Pines Fuels Corporation.

The current private owner purchased the property in 2007 and OU-1 will be reportedly redeveloped for commercial and/or industrial use.

Historical site structures are shown on Figure 3. In 1893 BG&E operated a small electric generating plant (EGP) on OU-1. Coal was shipped to the plant by barge, transferred from a small wharf on Westchester Creek, and stored on-site. BG&E constructed an MGP at OU-1 in 1904, with a production rate of approximately 750,000 cubic-feet of gas per day. Gas produced at the site was stored in aboveground storage tanks at the former Zerega Avenue gas holder site (located to the west across OU-1). The MGP was comprised of a generator house, engine room, purifiers, a meter room, auxiliary structures (e.g., exhausters, tar extractors, purifiers, etc.), and two water-gas sets that were constructed at an unspecified time during MGP operations. The EGP was removed from service in 1927. In 1928, the MGP located was connected to gas mains owned by Consolidated Gas Company and, on March 1, 1928, the MGP was shut down and placed on stand-by status. Most of the MGP features were decommissioned in 1929.

3 CHARACTERIZATION SUMMARY

This section presents an overall characterization of OU-2 and a summary of the nature and extent of impacted environmental media based on the results obtained during the RI activities. The OU-2 characterization consists of a summary of the geology, hydrogeology, and the nature and extent of environmental impacts.

A detailed summary of the results of the RI investigation activities is presented in the October 2014 OU-2 RI Report. Additionally, results of select investigation activities conducted in Watson Avenue are summarized in the October 30, 2013 *OU-1 Remedial Investigation Report* (Arcadis, 2013b).

3.1 Site Geology

A geologic cross-section location map and associated geologic cross-sections are provided as Figures 4 through 9. As shown on these figures, OU-2 is underlain by four principal stratigraphic units: fill; clay; glacial till; and bedrock (in descending order from the ground surface). The characteristics of these stratigraphic units is briefly described below:

- Fill – The ground surface (top of the fill unit) generally descends from west to east towards Westchester Creek. The top of the fill unit consists of construction debris (e.g., brick, cinders, ash, coal, wood and glass) intermingled with poorly sorted brown to black sand and gravel. In general, the thickness of this unit varies from approximately 17 to 19 feet in the western portion of OU-2 to approximately 16 feet along Westchester Creek. Additionally, the thickness of this unit increases to approximately 22 feet in the north central portion of the site near the Masonry Warehouse Building. The water table is generally found within this unit.
- Clay – The clay unit is a hydrogeologic confining unit and consists of post-glacial sediments formed in marshlands that historically extended along Westchester Creek. The clay unit consists of grey, medium stiff clay with trace amounts of sand and silt. Peat, roots, and shell fragments were frequently observed in samples collected at the clay unit. The top of the clay surface generally descends from west to east across OU-2; however, the clay unit also appears to descend from south to north (i.e., from OU-1 to OU-2). The thickness of the clay unit ranges from approximately 11 to 25.5 feet thick. Elevation and thickness contour maps for this confining unit are presented on Figures 10 and 11, respectively.
- Glacial Till – Glacial till appears to be continuous across OU-2, with the exception of the southwestern corner of OU-2 along Watson Avenue, where the clay unit appears to extend to bedrock, as shown on Figures 5 and 7. This unit consists of variably colored poorly sorted sand with silt and clay lenses. The average thickness (where encountered) of this unit is approximately 12 feet, with a maximum thickness of approximately 22 feet at the southeastern corner of OU-2 adjacent to Westchester Creek and minimum thickness of approximately 8 feet at the northeastern corner of OU-2.
- Bedrock – Depth to bedrock ranges from approximately 24 to 51 feet below grade. The top of bedrock generally descends from west to east, with the higher elevations along Zerega Avenue, and the lower elevations along Westchester Creek. A bedrock contour map is shown on Figure 12.

3.2 Hydrogeology

The hydrostratigraphy beneath OU-2 consists of two relatively permeable units (the fill and glacial till units) separated by the low-permeability clay confining unit. In general, groundwater levels measured on-site are higher than the level of Westchester Creek, indicating that groundwater discharges to the creek. The hydrogeology of the fill and glacial till units is as follows:

- Fill – The saturated portion of the fill unit represents the water table aquifer (uppermost unconfined aquifer), which is encountered at depths ranging from approximately 9.26 to 11 feet below grade. Groundwater in the fill generally flows toward the northeast near Zerega Avenue but turns to the east as it moves closer to Westchester Creek. The average saturated thickness of this hydrostratigraphic unit is approximately 5 feet. Hydraulic conductivity (K) values for the fill range between 3.92 and 18.8 feet/day. Horizontal hydraulic gradients in the fill are fairly constant, with values between 0.004 and 0.009 feet/foot (based on estimates using OU-1 data).
- Glacial Till – Groundwater flow in the glacial till is also to the east. Hydraulic conductivity values for the glacial till range between 0.09 and 25.61 feet/day. Horizontal hydraulic gradients in this unit are of similar magnitude to those observed in shallow groundwater (approximately 0.002 feet/foot); however, a steeper horizontal hydraulic gradient exists in the southern portion of OU-2 (approximately 0.018 feet/foot).

Water levels in Westchester Creek are subject to tidal fluctuation. According to National Oceanic and Atmospheric Administration (NOAA), the mean range of tide at Kings Point, Queens (NOAA Station 8516945), located approximately 4.5 miles southwest of OU-1, is 7.1 feet. A groundwater contour map for deep overburden (based on the April 28, 2014 gauging event) is shown on Figure 13.

3.3 Nature and Extent of Impacts

Identified impacts at the site consist of petroleum-related residual materials, manufactured gas production byproducts, and associated constituents of concern (COCs). Petroleum-related impacts are present in unsaturated (vadose zone) soil and within the water table fluctuation zone. MGP-related impacts are primarily encountered in saturated soil below the water table at the site.

Manufactured gas-production byproducts typically include purifier waste and dense non-aqueous phase liquid (DNAPL) (i.e., coal tar). Principal COCs associated with coal tar that are routinely analyzed for at MGP sites are benzene, toluene, ethylbenzene, and xylene (BTEX) compounds, which are volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAHs), which are semi-volatile organic compounds (SVOCs). The principal COC associated with purifier waste is cyanide, and as such, total and amenable cyanide are typically analyzed for samples collected during investigations of MGP sites. DNAPL and relatively elevated concentrations of BTEX and PAHs were observed in the soils and/or groundwater at OU-2. Purifier waste was not observed at OU-2 and total cyanide was only detected at relatively low concentrations in soil samples collected at OU-2 locations.

Petroleum-related impacts identified at the site include light non-aqueous phase liquid (LNAPL), BTEX compounds, and PAHs. Multiple documented petroleum releases occurred at the site between 1975 and 2000.

For the purposes of this RAWP, LNAPL, DNAPL, BTEX and PAHs are considered the primary COCs because these materials/compounds were identified in soil and/or groundwater at concentrations exceeding applicable SCGs. Total cyanide is not considered a COC for OU-2, as this compound was not detected above the protection of groundwater or commercial/industrial use soil cleanup objectives (SCOs). Summaries of the site-related impacts identified at OU-2 are presented in the following subsections.

3.3.1 Distribution of Visual Impacts and NAPL

Visual evidence of impacts in subsurface soil, including odors, visible staining, sheens, and/or limited quantities of non-aqueous phase liquid (NAPL) of both MGP residual and petroleum possible sources were observed in a majority (i.e., 16 out of 18 sampling locations) of sampling locations within OU-2. Field observations are shown on the geologic cross-sections presented as Figures 5 through 9. In addition, Figure 14 indicates all locations where NAPL was encountered in subsurface soil sampling locations.

NAPL (i.e., NAPL in quantities greater than sheens/blebs) were only observed at soil borings located within Watson Avenue in the southern portion of OU-2, with the exception of a soil boring located in the center of the NYCEDC lot (i.e., SB-301) where NAPL (identified as tar-like material) was observed. Additionally, NAPL was only observed in the saturated zone, with a majority of NAPL observations noted along the top of the clay unit. A summary of the NAPL observations is presented in the table below.

Table 3.1 Summary of NAPL Observations

Soil Boring ID	NAPL Observations	
	Depth (feet below grade)	Geologic Unit
SB-123	18 to 20.5	Fill (on top of clay unit)
	30 to 35	Glacial till (below clay unit)
MW-113A/SB-124A	15 to 16.5	Fill (on top of clay unit)
	36.2 to 36.5	Glacial till (below clay unit)
MW-113B/SB-124B	15 to 16.5	Fill (on top of clay unit)
SB-207	16.5 to 17.5	Fill (on top of clay unit)
SB-209	17 to 25	Fill (on top of clay unit)
SB-210	37.6 to 38	Glacial till (below clay unit)
SB-211	15 to 16	Fill (on top of clay unit)
	20 to 21	Fill (on top of clay unit)

NAPL gauging was conducted in monitoring wells within OU-2 on April 28, 2014, with the exception of MW-12 (which is no longer accessible). Previous NAPL gauging events for monitoring wells located within Watson Avenue were performed concurrent with OU-1 investigation activities on March 7, 2008, April 27, 2009, and June 19, 2013. LNAPL was not observed during the gauging events at OU-2. DNAPL was only

encountered in one monitoring well (i.e., MW-113B), located within Watson Avenue, during one monitoring event in 2008; the DNAPL thickness was approximately 1.4 feet.

3.3.2 Soil Quality

Subsurface soil analytical results were compared to the restricted commercial- and industrial-use SCOs and SCOs for protection of groundwater presented in 6 NYCRR Part 375-6.8(a) and (b). The commercial and industrial use SCOs are applicable to the site given that the current and anticipated future site use. The SCOs for the protection of groundwater are also potentially applicable given the close proximity of the site to Westchester Creek (located east of OU-2). In addition, site-specific screening values of 10 milligrams per kilogram (mg/kg) total BTEX and 500 mg/kg total PAHs have been established to aid in the delineation of soil containing site-related impacts. A distribution of soil samples with total BTEX and PAHs at concentrations exceeding 10 mg/kg and 500 mg/kg, respectively, is shown on Figure 14. Soil impacts are distributed as follows:

- Individual BTEX compounds were detected at concentrations exceeding the SCOs for the protection of groundwater in 19 of 62 subsurface soil samples collected from 11 locations. Only one soil sample contained individual BTEX compounds at concentrations exceeding commercial SCOs and no samples contained individual BTEX compounds at concentrations exceeding industrial SCOs. Total BTEX was detected at a concentration greater than 10 mg/kg in 10 soil samples collected from 7 locations. The majority of the soil samples containing individual BTEX compounds and total BTEX compounds at a concentration exceeding their respective criteria were collected from intervals immediately above the confining clay unit at locations within Watson Avenue. Subsurface soil samples that exhibited elevated total BTEX concentrations were generally collected from locations where visual impacts were observed.
- Individual PAHs were detected at concentrations exceeding SCOs for the protection of groundwater in 27 of 62 subsurface soil samples. A total of 18 soil samples contained individual PAH compounds at concentrations exceeding the commercial use SCOs and 17 soil samples contained individual PAH compounds at concentrations exceeding the industrial SCOs. Total PAHs were detected at concentrations greater than 500 mg/kg in 14 subsurface soil samples collected from 9 locations. Similar to elevated BTEX concentrations, soil samples that contained elevated concentrations of PAHs were generally collected from intervals immediately above the clay unit and in locations were visual impacts were observed.

3.3.3 Groundwater Quality

Laboratory analytical results for groundwater samples collected during the RI were compared to the groundwater quality standards/guidance values presented in the NYSDEC's *Division of Water*, *Technical and Operational Guidance Series 1.1.1: Ambient Water Quality Standards and Groundwater Effluent Limitations* (TOGS 1.1.1) (NYSDEC, 2008). Analytical results indicated the following (Figure 12):

- Individual BTEX compounds were only detected at concentrations exceeding the NYSDEC standards/guidance values at monitoring wells located within Watson Avenue (i.e., MW-112A, MW-113A, MW-113B, MW-114A, and MW-114B). Groundwater samples collected from deep monitoring wells generally contained BTEX at higher concentrations than groundwater samples collected from shallow monitoring wells. Additionally, groundwater samples collected from monitoring wells within

Watson Avenue generally contained BTEX at higher concentrations than groundwater samples collected from monitoring wells located within the NYCEDC's equipment laydown/storage lot.

- Individual PAH compounds were detected at concentrations exceeding the NYSDEC standards/guidance values at all monitoring wells located within Watson Avenue (i.e., MW-112A, MW-113A, MW-113B, MW-114A, and MW-114B) and two of three monitoring wells (i.e., MW-115 and located in the NYCEDC lot. Similar to BTEX concentrations, groundwater samples collected from deep monitoring wells generally contained PAHs at higher concentrations than groundwater samples collected from shallow monitoring wells. Groundwater samples collected from monitoring wells within Watson Avenue also contained PAHs at higher concentrations than groundwater samples collected from monitoring wells located within the NYCEDC's equipment laydown/storage lot.

4 IDENTIFICATION OF STANDARDS, CRITERIA, AND GUIDANCE

SCGs that have been identified as potentially applicable to the design and implementation of the proposed remedial alternative are presented below.

4.1 Definitions of Standards, Criteria, and Guidance

As defined in 6 NYCRR Part 375-1.8(f)(2), standards, criteria, and guidance values are defined as:

- "Standards and criteria" are cleanup standards, standards of control and other substantive environmental protection requirements, criteria or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance.
- "Guidance" is non-promulgated criteria, advisories and/or guidance that are not legal requirements and do not have the same status as "standards and criteria;" however, remedial programs should be designed with consideration given to guidance documents that, based on professional judgment, are determined to be applicable to the project (6 NYCRR 375-1.8[f][2][ii]).

Per the regulations, standards, criteria and guidance will be applied so that the selected remedy will conform to standards and criteria that are generally applicable, consistently applied and officially promulgated; and that are either directly applicable, or that are not directly applicable but relevant and appropriate, unless good cause (as defined in 6 NYCRR 375-1.8 [f][2][i]) exists why conformity should be dispensed with.

4.2 Types of Standards, Criteria, and Guidance

Potential SCGs considered are categorized as follows:

- Chemical-Specific SCGs – These SCGs are health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numerical values for each COC. These values establish the acceptable amount or concentration of chemical constituents that may be found in, or discharged to, the ambient environment.
- Action-Specific SCGs – These SCGs are technology- or activity-based requirements or limitations on actions taken with respect to hazardous waste management and remediation of the site.
- Location-Specific SCGs – These SCGs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in specific locations.

4.3 Potentially-Applicable Standards, Criteria and Guidance

A detailed list of chemical-, action-, and location-specific SCGs that are potentially applicable to the former Unionport Works site are presented in Tables 1 through 3, respectively, of the NYSDEC-approved OU-1 AAR. Primary SCGs that were considered during the development of this RAWP and that are applicable for the design and implementation of the proposed remedial alternative presented herein include the following:

- NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation.
- Restricted commercial- and industrial-use SCOs and SCOs for protection of groundwater presented in 6 NYCRR Part 375-6.8(a) and (b).
- Site-specific clean-up criteria identified in this RAWP (i.e., NAPL in quantities greater than sheens/blebs [NAPL coated/saturated] with total BTEX over 10 mg/kg and PAHs over 500 mg/kg).
- Groundwater quality standards/guidance values presented in the NYSDEC's TOGS 1.1.1.
- Resource Conservation and Recovery Act (RCRA) and New York State (NYS) regulations regarding identifying and listing hazardous wastes outlined in 40 Code of Federal Regulations (CFR) 261 and 6 NYCRR Part 371, respectively.
- United States Environmental Protection Agency (USEPA) Universal Treatment Standards/Land Disposal Restrictions (UTSs/LDRs), as listed in 40 CFR Part 268. Applicable to waste materials generated at OU-2 and determined to be a hazardous waste.
- New York Air Quality Standards for air emissions (6 NYCRR Parts 257). Community air monitoring would be required in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan.
- Occupational Safety and Health Standards (OSHA) (29 CFR 1910 and 29).
- United States Department of Transportation (USDOT) requirements for packaging, labeling, manifesting, and transporting hazardous or regulated materials

5 REMEDIAL ACTION OBJECTIVES

RAOs are media-specific goals that are protective of public health and the environment. RAOs have been developed through consideration of the results of the site investigation activities and with reference to potential SCGs, as well as current and foreseeable future anticipated site uses.

RAOs have been developed to address the specific COCs at OU-2 and have been developed based on NYSDEC's generic RAOs (NYSDEC, 2016).

RAOs for Soil

RAOs for Public Health Protection

1. Prevent, to the extent practicable, ingestion/direct contact with site-related COCs/ NAPL.
2. Prevent, to the extent practicable, inhalation of or exposure to site-related COCs from impacted soil.

RAOs for Environmental Protection

3. Address, to the extent practicable, site-related COCs/NAPL in soil that could result in impacts to groundwater, surface water, or sediment.

RAOs for Groundwater

RAOs for Public Health Protection

1. Prevent, to the extent practicable, ingestion of groundwater containing site-related dissolved phase COCs at concentrations exceeding NYSDEC groundwater quality standards or guidance values.
2. Prevent, to the extent practicable, contact with or inhalation of VOCs from groundwater containing site-related COCs at concentrations exceeding NYSDEC groundwater quality standards or guidance values.

RAOs for Environmental Protection

3. Restore groundwater to pre-disposal/pre-release conditions, to the extent practicable.
4. Address the source of site-related groundwater impacts to the extent practicable.

The proposed remedial alternative presented in Section 6 was developed based on its ability to meet the RAOs and be protective of public health and the environment.

6 PROPOSED REMEDIAL ALTERNATIVE

The primary components of the proposed remedial alternative consist of the following:

- Installing NAPL monitoring/recovery wells
- Abandoning several existing groundwater monitoring wells
- Conducting long-term groundwater monitoring and /NAPL monitoring/recovery activities
- Establishing institutional controls
- Developing a site management plan

Site-related impacts that have been identified at OU-2 are generally limited to the southern portion of OU-2 (i.e., primarily within Watson Avenue) and are located along the top of the clay unit. Although site-related impacts would remain at the current time, the proposed remedial alternative will reduce the already limited potential for exposure to soil and groundwater containing site-related impacts through the implementation of institutional controls. Additionally, the proposed remedial alternative includes long-term NAPL recovery to reduce the volume/mass of NAPL and reduce the potential for future NAPL migration north of Watson Avenue. The proposed remedial alternative also includes long-term groundwater monitoring to document the extent and potential trends of dissolved phase impacts in COC concentrations. Con Edison will consider directly addressing (via excavation or in-situ soil solidification) impacted soil (i.e., soil containing NAPL with total BTEX concentrations greater than 10 mg/kg and total PAHs at concentrations greater than 500 mg/kg) within the Watson Avenue if the site use changes and/or if continued monitoring of groundwater/NAPL shows increasing trends or migration of dissolved phase impacts/NAPL. The primary components of the proposed remedial alternative are summarized below.

6.1 NAPL Monitoring/Recovery Wells & NAPL Recovery Program

The proposed remedial alternative includes the installation of four NAPL monitoring/recovery wells in the northern portion of Watson Avenue (Figure 16). The NAPL monitoring/recovery wells would consist of 6-inch diameter schedule 40 PVC wells, equipped with 10-foot long 0.02-inch (20 slots per inch) well screens and a 5-foot-long sump. The bottom of the well screens will extend a minimum of 6 inches into the confining clay unit and the borehole annulus surrounding the sump will be grouted to the top of the sump.

A long-term monitoring and recovery program would be established following installation of the wells to gauge for the presence of NAPL and remove NAPL from the wells to the extent possible to address NAPL present to the north of OU-1. NAPL recovery will be conducted passively by periodically manually bailing or by periodically pumping (with a portable pump) NAPL from the wells. The frequency of NAPL monitoring/ recovery activities will be based on the results of an initial period of NAPL monitoring.

6.2 Groundwater/NAPL Monitoring

Groundwater within OU-2 contains BTEX and PAHs at concentrations greater than NYSDEC TOGS 1.1.1, as indicated in Section 3. Therefore, the proposed remedial alternative includes conducting annual groundwater monitoring to document potential changes in groundwater conditions.

Prior to the start of groundwater monitoring activities, select existing monitoring wells screened below the confining clay unit (i.e., MW-112, MW-113B, MW-115, MW-116, and MW-117) will be abandoned. Existing

monitoring well decommissioning activities will be completed in accordance with NYSDEC's guidance CP-43 Groundwater Monitoring Well Decommissioning Policy (NYSDEC, 2009). Consistent with NYSDEC's policy, existing monitoring wells will be decommissioned via pulling the upper five feet of well casing and grouting the wells in place (to ground surface) with a non-shrink grout.

Annual groundwater monitoring activities would consist of collecting groundwater samples from the existing groundwater monitoring well network in OU-2 (shown on Figure 16). Groundwater samples would be submitted for laboratory analysis for BTEX and PAHs. Analytical results would then be used to document the extent of dissolved phase impacts and potential trends in COC concentrations.

During annual groundwater monitoring activities, potentially mobile NAPL (if any) that accumulates in the existing monitoring wells would be collected to reduce the volume/mass of NAPL at OU-2 and reduce the potential for future NAPL migration downgradient of OU-2. NAPL collection will be conducted in accordance with the NAPL recovery program to be established under this proposed remedial alternative.

The results of the groundwater/NAPL monitoring activities (as well as of the NAPL recovery activities described above) would be presented to NYSDEC in an annual report. Based on the results of the groundwater/NAPL monitoring activities, Con Edison may request to modify the quantity of wells sampled or the frequency of sampling events.

6.3 Institutional Controls

The proposed remedial alternative also includes establishing institutional controls in the form of an Environmental Notice to:

- Require Con Edison to provide a periodic certification of institutional and engineering controls to the NYSDEC in accordance with Part 375-1.8(h)(3).
- Limit the land use and development of OU-2 to restricted-commercial, or industrial as defined by 6 NYCRR Part 375-1.8(g) and local zoning laws.
- Limit the permissible invasive (i.e., subsurface) activities that could result in potential exposures to subsurface soil and groundwater.
- Restrict the use of groundwater for potable or process water purposes, unless proper water quality treatment is conducted, as determined by NYSDOH.
- Require compliance with the NYSDEC-approved Site Management Plan (SMP) (described below).

Institutional controls will also include an agreement with the property owner(s) to implement the remedy and NYSDEC-approved SMP. Con Edison would prepare and submit an annual report to NYSDEC documenting that institutional controls are maintained and remain effective, as well as to summarize annual groundwater monitoring/NAPL recovery activities.

6.4 Site Management Plan

As indicated above, this alternative includes the preparation of an SMP that would document the following:

- The institutional controls that would be established and maintained for OU-2.

- Known locations of soil containing COCs at concentrations greater than restricted-commercial or industrial SCOs and SCOs for protection of groundwater presented in 6 NYCRR Part 375-6.8(a) and (b), and total BTEX and PAH concentrations exceeding 10 mg/kg and 500 mg/kg.
- A flow chart showing guidelines for intrusive activities (included as Appendix A)
- Protocols (including health and safety requirements) for conducting invasive (i.e., subsurface) activities and managing potentially impacted material encountered during these activities.
- Protocols and requirements for conducting annual groundwater monitoring/NAPL recovery.
- Protocols for addressing significant changes in COC concentrations in groundwater based on the results of the annual monitoring activities.
- Requirements for performing periodic site inspections, providing NYSDEC-required certifications, and submitting periodic reports to NYSDEC (including a periodic review report (PRR) per DER-10 Section 6.3).

The SMP will also include a provision for evaluating the potential for soil vapor intrusion for any buildings developed on OU-2, including provisions for implementing actions recommended to address exposures (if any) related to soil vapor intrusion.

6.5 Health and Safety

For the proposed remedial alternative-related and potential future intrusive activities, the contractor or owner performing the construction activities will prepare a project-specific Health and Safety Plan (HASP) that meets the requirements of DER-10, 29 CFR 1910, 29 CFR 1926, and all other applicable federal, NYS and local laws and regulations.

NYSDOH requires that real-time monitoring for VOCs and particulates (i.e., dust) be conducted during intrusion activities at contaminated sites at the downwind perimeter of each designated work area. This air monitoring conducted during future intrusive remediation or construction excavation activities should be completed in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP) provided as Appendix B.

The purpose of CAMP is to prevent exposure of the community to airborne hazardous constituents at levels above accepted regulatory limits. For the future remediation and construction activities, the worker protection and community air monitoring will be conducted by the contractor's or owner's representative performing the construction activities.

6.6 Annual Site Inspections

In accordance with DER-10 Section 6.3, a PRR will be submitted to the NYSDEC to document the effectiveness of the institutional and engineering controls. An institutional controls/engineering controls certification checklist that will be used during the annual PRR is included in Appendix C. The PRR will be signed by a professional engineer or other qualified environmental professional and will include recommendations for modifying the SMP requirements and reporting frequency, as necessary. If changes are noted, the PRR will include documentation explaining why the certification cannot be rendered, along

with a statement of proposed corrective measure(s) and a proposed schedule for implementing the corrective action(s).

6.7 Evaluation of the Proposed Remedial Alternative

Consistent with DER-10 Subsection 4.2(a).1, the proposed remedial alternative was evaluated against required threshold criteria, including Compliance with SCGs and Overall Protectiveness of Public Health and the Environment. Additionally, the proposed remedial alternative was evaluated against five balancing criteria, including Short-Term Effectiveness; Long-Term Effectiveness; Land Use; Reduction of Toxicity, Mobility or Volume of Contamination through Treatment; and Implementability. Additional criteria, including public and state acceptance, will be addressed following submittal of this RAWP. A description of the evaluation criteria is presented in DER-10 Subsection 4.2(a).1.

6.7.1 Overall Protectiveness of Public Health and the Environment

The proposed remedial alternative would further reduce the already limited potential for exposures to soil and groundwater containing site-related impacts through groundwater monitoring/NAPL recovery and implementing institutional controls. Although, site-related impacts would remain, the proposed remedial alternative would limit the potential for exposures (i.e., direct contact, ingestion, and inhalation) to site-related impacts in soil and groundwater (soil RAOs #1 and #2 and groundwater RAOs #1 and #2) through the implementation of institutional controls and adherence to the procedures to be presented in the SMP.

The proposed remedial alternative would also work toward addressing potential sources of groundwater impacts (soil RAO #3 and groundwater RAO #4) by removing NAPL via the NAPL monitoring/recovery wells that would be installed north of Watson Avenue. However, if groundwater is restored to pre-disposal/ pre-release conditions (groundwater RAO #3), it would occur over a prolonged period of time (i.e., through continued weathering of NAPL and dissociation of related COCs and natural attenuation of dissolved phase impacts).

6.7.2 Compliance with SCGs

The proposed remedial alternative would not address soil containing COCs at concentrations greater than restricted-commercial or -industrial SCOs and SCOs for protection of groundwater presented in 6 NYCRR Part 375-6.8(a) and (b) and/or sol containing limited quantities of NAPL; impacted soil would remain in place.

Although the proposed remedial alternative includes installation of NAPL monitoring/recovery wells and implementation of a NAPL recovery program, impacted soil would remain in-place and therefore, the proposed remedial alternative would likely not achieve groundwater SCGs within a determinate period of time. Waste materials generated during NAPL monitoring/recovery well installation and periodic groundwater monitoring/NAPL recovery activities would be managed and characterized in accordance with 40 CFR 261 and 6 NYCRR Part 371 to determine off-site treatment/disposal requirements. NYS LDRs would apply to any materials that are characterized as a hazardous waste.

Waste materials could also be subject to USDOT requirements for packaging, labeling, manifesting, and transporting hazardous or regulated materials. Compliance with these requirements would be achieved by

following an NYSDEC-approved work plan and using licensed waste transporters and permitted disposal facilities.

NAPL monitoring/recovery well installation activities would be conducted in accordance with NYC building/ construction codes and ordinances, as necessary. Local permits would be obtained prior to initiating the remedial activities (if any).

6.7.3 Short-Term Effectiveness

Implementation of the proposed remedial alternative could result in limited short-term exposure of the surrounding community and workers to site-related COCs during installation of NAPL monitoring/recovery wells. Potential exposure mechanisms include ingestion and dermal contact with NAPL; impacted soil and/or groundwater; and inhalation of volatile organic vapors or dust containing COCs.

Potential exposure of remedial workers would be minimized through the use of appropriately trained field personnel, engineering controls, and personal protective equipment (PPE), as specified in the HASP that would be developed prior to the implementation of this proposed remedial alternative. Air monitoring would also be performed during NAPL monitoring/recovery well installation activities to evaluate the need for additional engineering controls (e.g., use of water sprays to suppress dust, modify the drilling rate, etc.). Community access to OU-2 would be restricted by the existing security fencing.

Additional worker safety concerns include working with and around large drilling equipment and noise generated from operating drilling equipment. These concerns would be minimized by using engineering controls and appropriate health and safety practices.

Potential short-term risks to the community could occur during periodic groundwater monitoring/NAPL recovery activities via exposure to purged groundwater, groundwater samples, and recovered NAPL (if any). Potential exposures to the community would be reduced by following appropriate procedures and protocols that would be described in the SMP.

Although the proposed remedial alternative does not employ green remediation practices, implementation of this alternative would utilize minimal non-renewable resources and is not anticipated to negatively impact the environment (i.e., consume non-renewable resources and energy). The carbon footprint of the proposed remedial alternative would be minimal. The greatest contribution to greenhouse gases would occur as a result of traveling to and from the site to conduct groundwater monitoring/NAPL recovery activities.

6.7.4 Long-Term Effectiveness

Soil and groundwater containing site-related COCs and/or limited quantities of NAPL would remain under the proposed remedial alternative. However, the newly installed NAPL monitoring/recovery wells and proposed NAPL monitoring and recovery program would limit the potential for further migration of potentially mobile NAPL (if any) that would remain beneath Watson Avenue. Additionally, the NAPL removal would reduce, to certain extent, the source of impacts and therefore, groundwater COC concentrations would be expected to decrease over a long period of time. The proposed remedial alternative would also include the establishment of institutional controls and development of an SMP to reduce the potential for exposures to impacted media during intrusive activities by site workers.

A majority of the OU-2 is covered with asphalt pavement, concrete, or vegetated soil which provides a physical barrier to subsurface impacts. Activities that could potentially result in exposure to soil and groundwater containing site-related COCs would not be routinely conducted based on the current and foreseeable future use of OU-2 (i.e., restricted-commercial/industrial). Additionally, because of the location of site-related impacts is generally limited to areas below Watson Avenue, the potential for future site construction activities to encounter impacted media is low. If subsurface activities (e.g., installation of new utilities) were to be conducted at OU-2, work activities (including handling of potentially impacted material) would be conducted in accordance with the procedures described in the SMP to reduce the potential for exposures to impacted media during intrusive activities by site workers.

Annual verification of the institutional controls would be completed to document that the controls are maintained and remain effective. The proposed remedial alternative also includes periodic groundwater/NAPL monitoring activities to document site conditions.

6.7.5 Land Use

In accordance with the NYC Planning Commission Zoning Map 4b (NYC, 2010), the current zoning for OU-2 is listed as manufacturing (i.e., M1-1 – Light Manufacturing District). Areas immediately surrounding Ou-2 are zoned for manufacturing (i.e., M1-1 – Light Manufacturing District, M2-1 – Medium Manufacturing District, and M3-1 – Heavy Manufacturing District), commercial (i.e., C8-1 – General Service District), and residential (i.e., R5 – General Residence District). The current and foreseeable future use of the area surrounding OU-2 is commercial and industrial). The current and foreseeable future use of OU-2 (i.e., Block 3888, Lots 5 & 6) is commercial and/or industrial.

Implementation of the proposed remedial alternative is not anticipated to alter current or anticipated future use of OU-2. Institutional controls would be placed on the properties within OU-2 and groundwater monitoring/NAPL recovery would be conducted to monitor any potential change in site conditions. In the event that the properties within OU-2 are sold, future owners/operators would be required to comply with the SMP and institutional controls established based on the continued presence of soil and groundwater containing site-related COCs. There would be limited potential for impacts to human health based on the current and anticipated future site use. The proposed institutional controls would further mitigate the potential for exposure.

6.7.6 Reduction of Toxicity, Mobility or Volume of Contamination through Treatment

The proposed remedial alternative includes the installation of NAPL monitoring/recovery wells, periodic NAPL monitoring and removal of NAPL that may collect in the wells. Through the NAPL monitoring/recovery activities, the volume of mobile NAPL would be permanently reduced, thereby reducing the potential for further downgradient migration of potentially mobile NAPL. NAPL removal would also permanently reduce the volume of material that is serving as a source to dissolved phase groundwater impacts, reducing the flux of COCs from source material to groundwater, effectively reducing the toxicity and volume of dissolved phase groundwater impacts. The proposed remedial alternative also includes annual groundwater monitoring to document the extent and potential long-term reduction (i.e., toxicity and volume) of dissolved phase groundwater impacts.

6.7.7 Implementability

The proposed remedial alternative is both technically and administratively feasible. From a technical implementability aspect, equipment and personnel qualified to perform NAPL monitoring/recovery well installation and groundwater/NAPL monitoring activities are readily available. Administratively, implementation of the proposed remedial alternative would require access agreements for work activities on properties not owned by Con Edison. Access agreements would also be required to conduct long-term groundwater/ NAPL monitoring on non-owned properties.

7 SCHEDULE

The anticipated schedule for implementing the proposed remedial alternative identified in this RAWP (e.g., installing new NAPL monitoring/recovery wells, establishing institutional controls/engineering controls, and preparing the SMP) is presented below.

Table 7-1. Preliminary Project Schedule

Schedule Component	Date
Install New NAPL Monitoring/Recovery Wells	3 Weeks
Establish Institutional Controls/Engineering Controls	4 Weeks
Submit Draft SMP to NYSDEC	12 Weeks
Receive NYSDEC comments	6 Weeks
Submit Final SMP to NYSDEC	4 Weeks

This schedule for implementing the proposed remedial alternative is dependent on several factors, including time required to gain property access and receipt of NYSDEC comments on project submittals.

8 REFERENCES

Arcadis, 2013a. Remedial Investigation Report Former Unionport Works Site - Westchester Creek Sediment Investigation. Former Unionport Works Site, Bronx, New York. March 2013.

Arcadis, 2013b. OU-1 Remedial Investigation Report. Former Unionport Works Site, Bronx, New York. October 2013.

Arcadis, 2014a. OU-2 Remedial Investigation Report. Former Unionport Works Site, Bronx, New York. October 2014.

Arcadis, 2014b. OU-1 Alternatives Analysis Report. Former Unionport Works Site, Bronx, New York. July 2014.

GEI, 2002. Manufactured Gas Plant History: Unionport Works and Zerega Avenue Station. December, 2002.

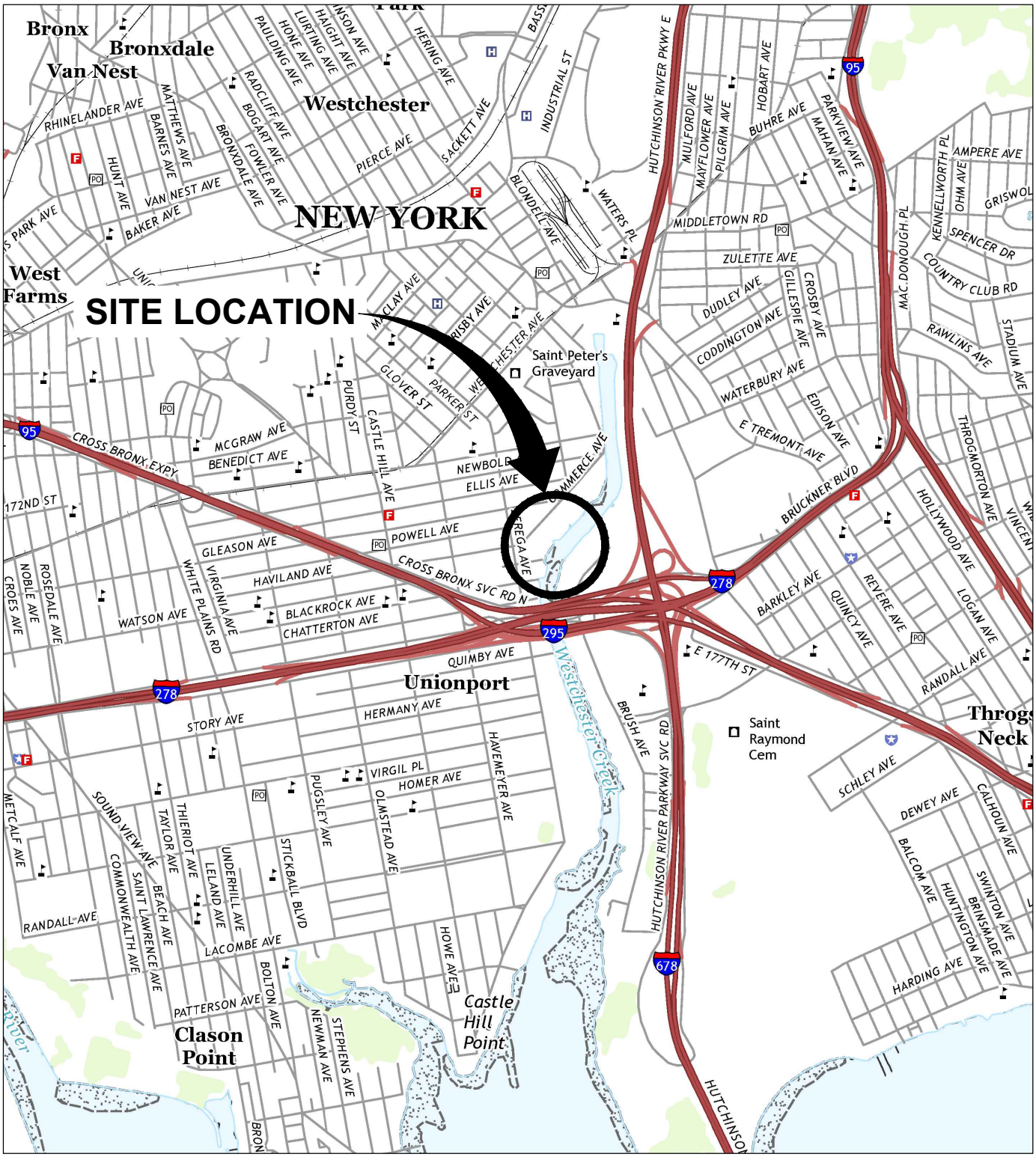
NYC, 2010. New York City Planning Commission Zoning Map 4b, C 080197 MMX, New York, NY, December 2010.

NYSDEC, 2008. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (TOGS 1.1.1), Reissued June 1998 and addended April 2000 and June 2004.

NYSDEC, 2009. CP-43, Groundwater Monitoring Well Decommissioning Policy, November 2009.

NYSDEC, 2010. DER-10 Technical Guidance for Site Investigation and Remediation. May 3, 2010.

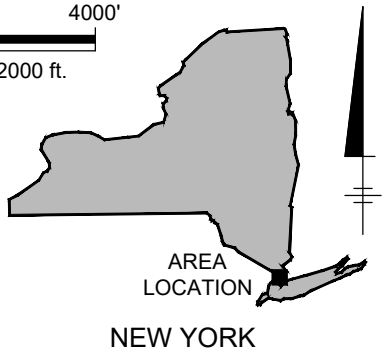
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., FLUSHING, NY, 2016.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



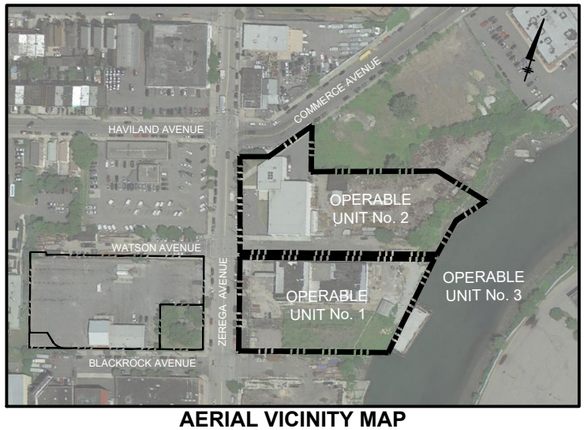
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

COMMERCE AVENUE
SIDEWALK
PAVED PARKING AREA
DIRT
TREES
GRASS
SIDEWALK
SB-304
GRASS
OFFICE BUILDING
PAVEMENT
TREES
TREES
WARE HOUSE
MW-116
SB-306
MW-117
SB-307
SB-305
NYSEDC LAYDOWN/ STORAGE LOT
MW-115
SB-302
SB-301
STONE RIVERBANK
WESTCHESTER CREEK
FLOW DIRECTION
ZEREGA AVENUE
SIDEWALK
CONC.
SIBLING FUEL OIL GARAGE BUILDING
GRASS
PAVED PARKING AREA
OPERABLE UNIT NO. 2
TREES
SB-207
SB-208
SB-209
SB-210
SB-211
MW-114A
SB-300A
MW-114B
SB-300B
MW-112
SB-128
SB-303
GATE
1 STY BRICK BLDG.
SB-123
MW-113B
SB-124B
MW-113A
SB-124A
WATSON AVENUE
2 STY BRICK BLDG.
1 STY BRICK BLDG.
TP-103
TP-102
MW-101A
SB-102A
SB-101
MW-101B
SB-102B
MASONRY WAREHOUSE BLDG.
SB-109
SB-111
SB-125
SB-112
TP-114
CONC.
SB-113
MW-110A
SB-126A
MW-110B
SB-126B
SB-115
UNPAVED AREA
BULKHEAD
OPERABLE UNIT NO.3
SB-122
TP-105
TP-104
TP-106
TP-108
MW-02
MW-103
TP-113
SB-110
MW-111
SB-127
MW-03
SIDEWALK
TP-107
SB-103
TP-112
SB-114
SB-120
TP-110
SB-107
SB-108
MW-07
MW-08
SB-116
1 STY BRICK BLDG.
MW-109
SB-104
SB-206
OPERABLE UNIT NO. 1
PETROLEUM STORAGE TANKS
TIMBER STEPS
SB-205
SLOPE
SB-118
SB-201
MW-102
SB-106
MW-108
TP-111
SB-204
SB-121
SB-105
MW-06
MW-107
SB-202
SB-119
SB-203
MW-01
BLACKROCK AVENUE



AERIAL VICINITY MAP
NO SCALE

LEGEND:

- CHAINLINK FENCE
- X FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- OIL RECOVERY SHED
- OIL/WATER SEPARATOR
- MW-103 GROUNDWATER MONITORING WELL
- SB-111 SOIL BORING
- TP-106 TEST PIT
- INDICATES BORING DRILLED AT AN ANGLE BELOW PETROLEUM STORAGE TANK

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014. AERIAL PHOTO FROM GOOGLE EARTH PR0, DATED JUNE 16, 2010.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.

0 80' 160'
GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

CURRENT SITE LAYOUT

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY: SYRACUSE NY GROUP: EnvCAD DB: R.ALLEN, E. KRAHMER LD:(Opt.) PIC: M. MILLER PM/TM: M. JONES TR: M. KISER LYR:ON=*;OFF=REF, (FRZ)
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\CON EDISON\Former Zerega Ave. Gas Holder Site\2018\B0043515.0020\01-DWG\RAWP-Fig2-Current Site Layout.dwg
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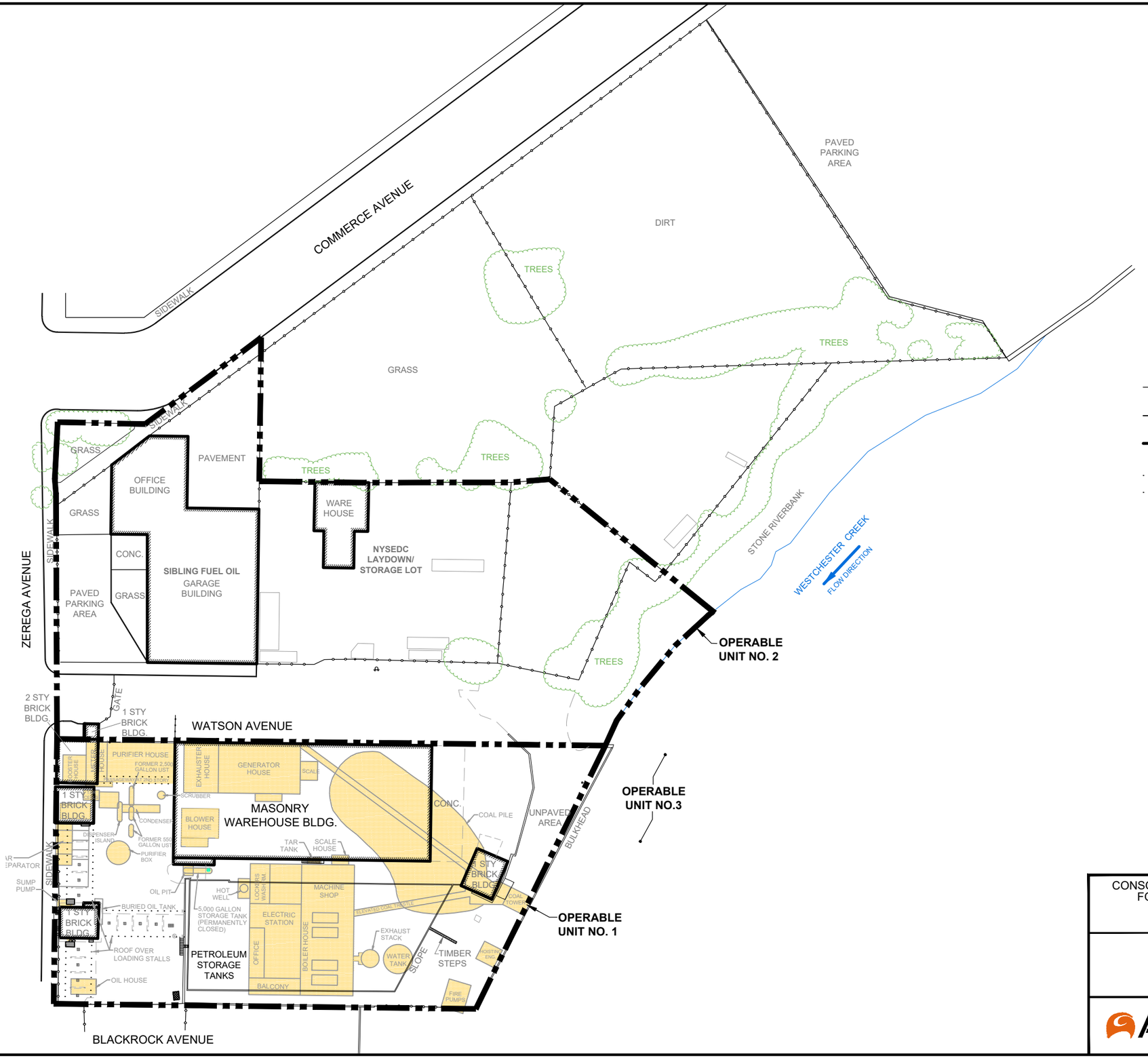

LEGEND:

- CHAINLINK FENCE
- X FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- OIL RECOVERY SHED
- OIL/WATER SEPARATOR
- HISTORIC SITE FEATURES

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

SITE MAP WITH FORMER MGP STRUCTURES

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE NY GROUP: EnvCAD DB: R.ALLEN, E. KRAHMER LD:(Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
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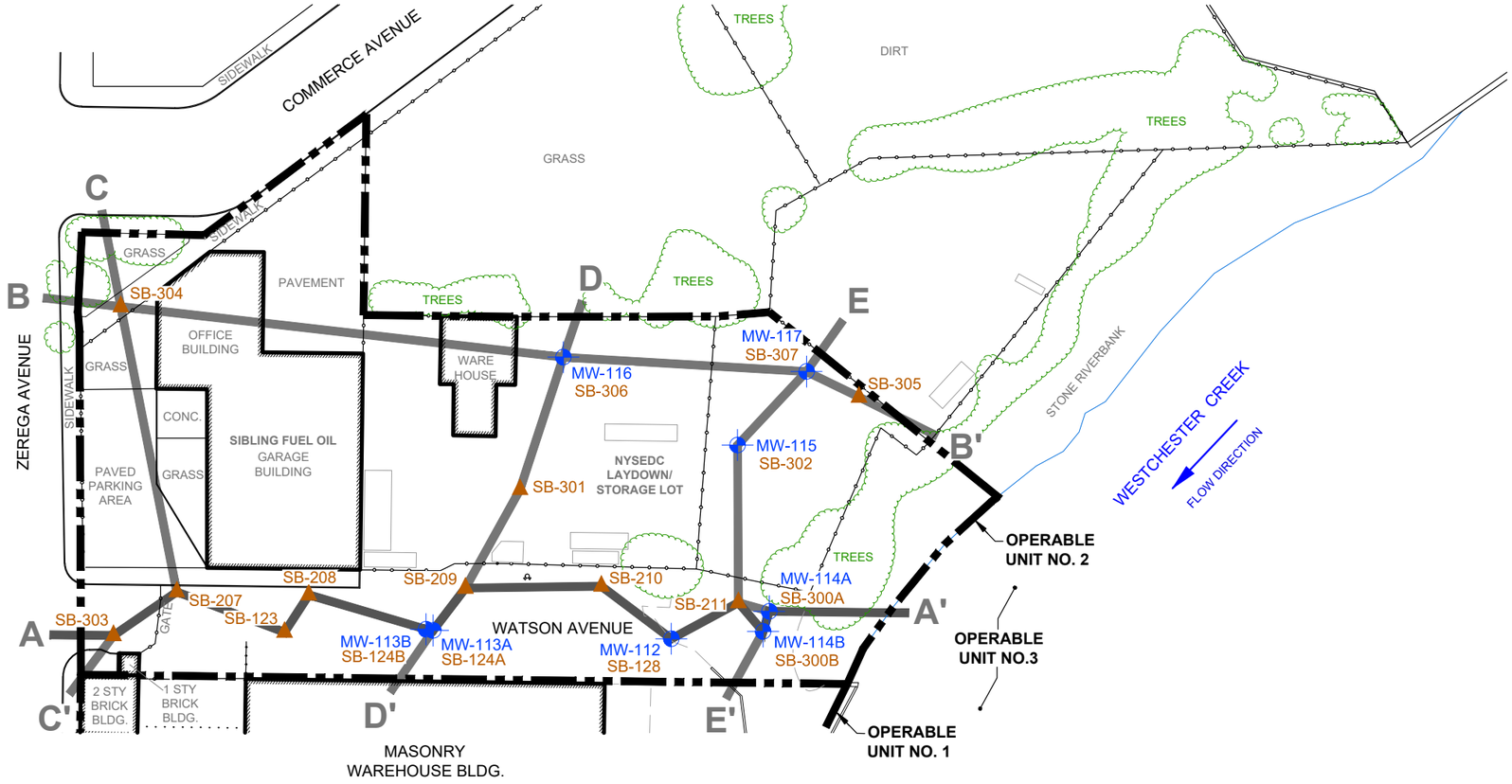
X-Base Map



LEGEND:

- CHAINLINK FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- MW-103 GROUNDWATER MONITORING WELL
- SB-111 SOIL BORING
- A — A' CROSS SECTION LOCATION

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

GEOLOGIC CROSS SECTION LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY: SYRACUSE NY GROUP: ENV/IM-DV DB: E. KRAHMER, R. ALLEN LD: (Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\CON EDISON\Former Zerega Ave. Gas Holder Site\2018\B0043515.0020\01-DWG\RAWP-Fig4-Cross Sec Loc Map.dwg LAYOUT: 4 SAVED: 5/21/2018 12:44 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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IMAGES:
RAWP-Title Block
X-Base Map

A WEST — **A'** EAST

SB-303 (SECTION C-C') | SB-207 | SB-123 | SB-208 | MW-113B/SB-124B - (SECTION D-D') | MW-113A/SB-124A | SB-209 | SB-210 | MW-112/SB-128 | SB-211 | MW-114B/SB-300B | MW-114A/SB-300A (SECTION E-E') | WESTCHESTER CREEK

ELEVATION (FT AMSL): 30, 20, 10, 0, −10, −20, −30, −40

FILL

ALLUVIAL CLAY

SILT

SANDY TILL

BEDROCK (GNEISS)

LEGEND:

- SB-303 — WELL OR BORING ID
- GROUND SURFACE
- GROUNDWATER
- LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
- SCREEN
- SUMP
- BOTTOM OF BORING

- UNDIFFERENTIATED FILL
- ALLUVIAL CLAY
- GLACIAL TILL (SAND AND SILT)
- SILT
- GNEISS (HARTLAND FORMATION)

- TAR SATURATED
- COATED MATERIAL
- BLEBS, SHEEN
- STAINING, ODOR
- PETROLEUM IMPACTS STAINING, ODORS

NOTES:

1. WATER ELEVATION IN WESTCHESTER CREEK IS APPROXIMATE.
2. GROUNDWATER ELEVATIONS AS MEASURED ON 4/28/2014.

VERTICAL EXAGGERATION = 4X

0 10' 20'
VERTICAL SCALE

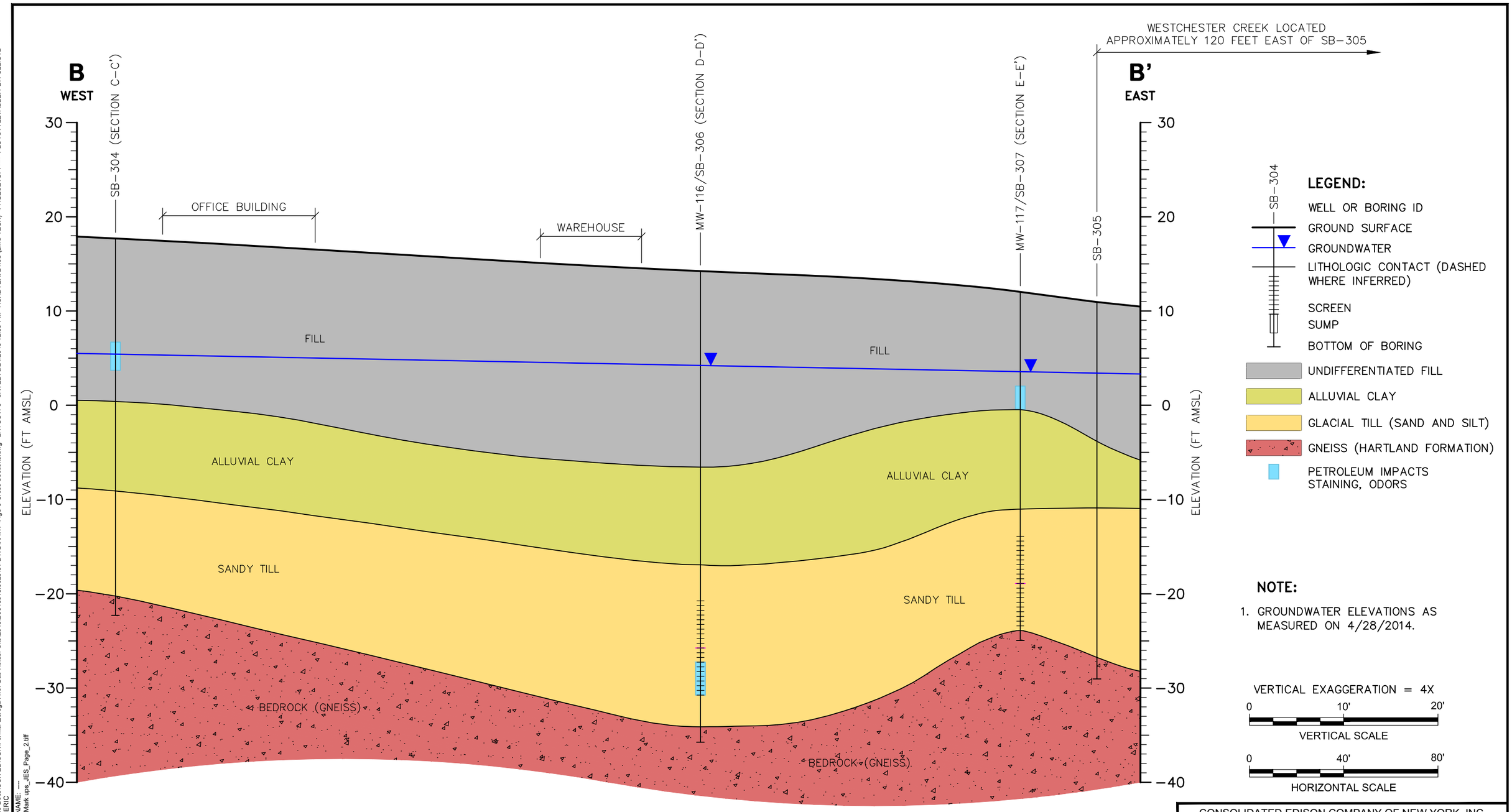
0 40' 80'
HORIZONTAL SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

GEOLOGIC CROSS SECTION A-A'

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5



NOTE:

1. GROUNDWATER ELEVATIONS AS MEASURED ON 4/28/2014.

VERTICAL EXAGGERATION = 4X

0 10' 20'

VERTICAL SCALE

0 40' 80'

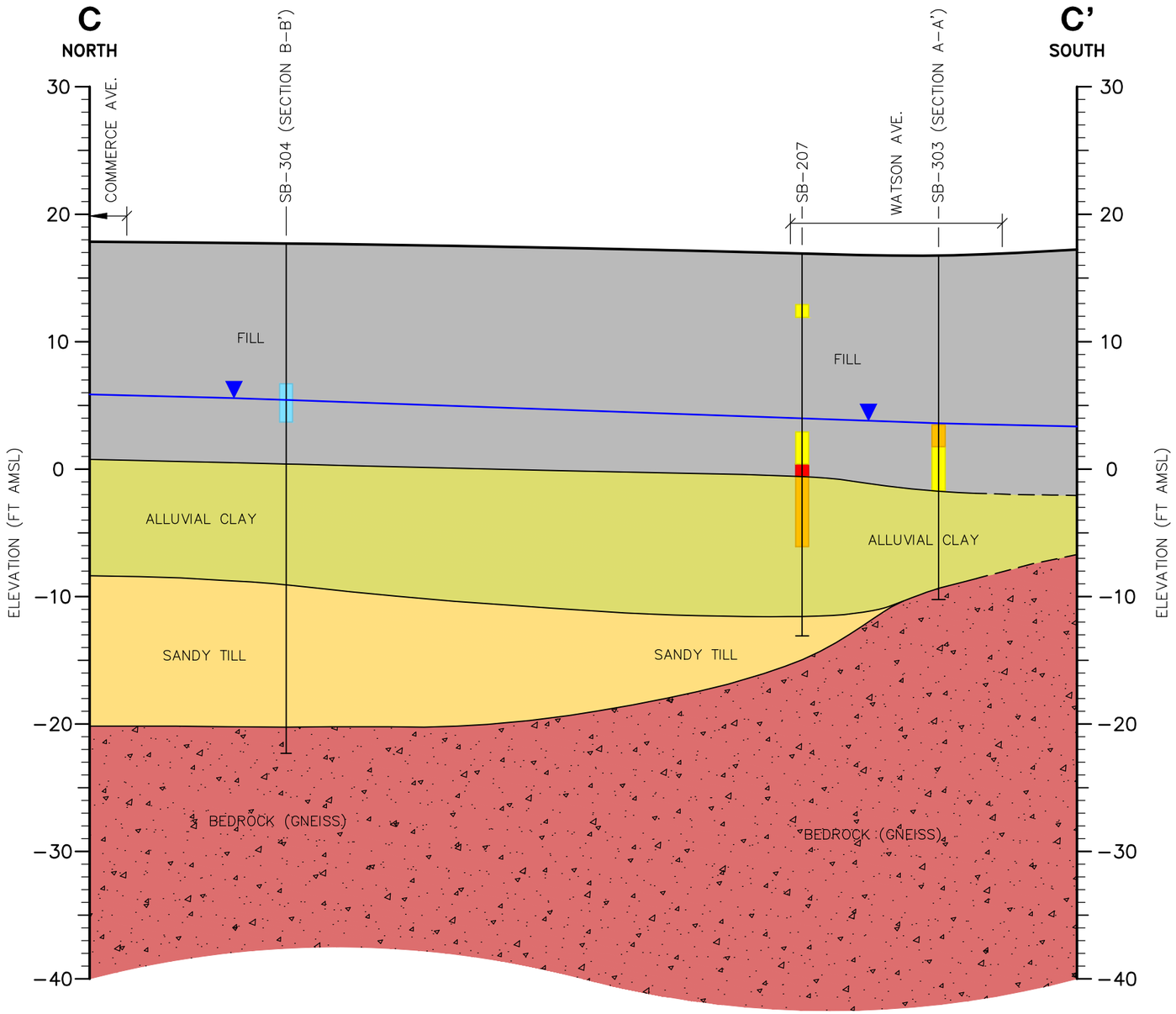
HORIZONTAL SCALE

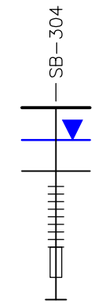
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

GEOLOGIC CROSS SECTION B-B'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6





LEGEND:

- WELL OR BORING ID
- GROUND SURFACE
- GROUNDWATER
- LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
- SCREEN
- SUMP
- BOTTOM OF BORING
- UNDIFFERENTIATED FILL
- ALLUVIAL CLAY
- GLACIAL TILL (SAND AND SILT)
- GNEISS (HARTLAND FORMATION)
- TAR SATURATED
- BLEBS, SHEEN
- STAINING, ODOR
- PETROLEUM IMPACTS STAINING, ODORS

NOTES:

1. GROUNDWATER ELEVATIONS AS MEASURED ON 4/28/2014..

VERTICAL EXAGGERATION = 4X

0 10' 20'

VERTICAL SCALE

0 40' 80'

HORIZONTAL SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

GEOLOGIC CROSS SECTION C-C'

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

CITY:SYRACUSE NY GROUP:ENV/IM-DV DB: E. KRAHMER, R. ALLEN PIC: PM/TM: TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF,(FRZ)
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\CON EDISON\Former Zerega Ave. Gas Holder Site\2018\B0043515.0020\01-DWG\RAWP-Fig5-9-Cross Sections.dwg LAYOUT: 7 SAVED: 5/21/2018 12:35 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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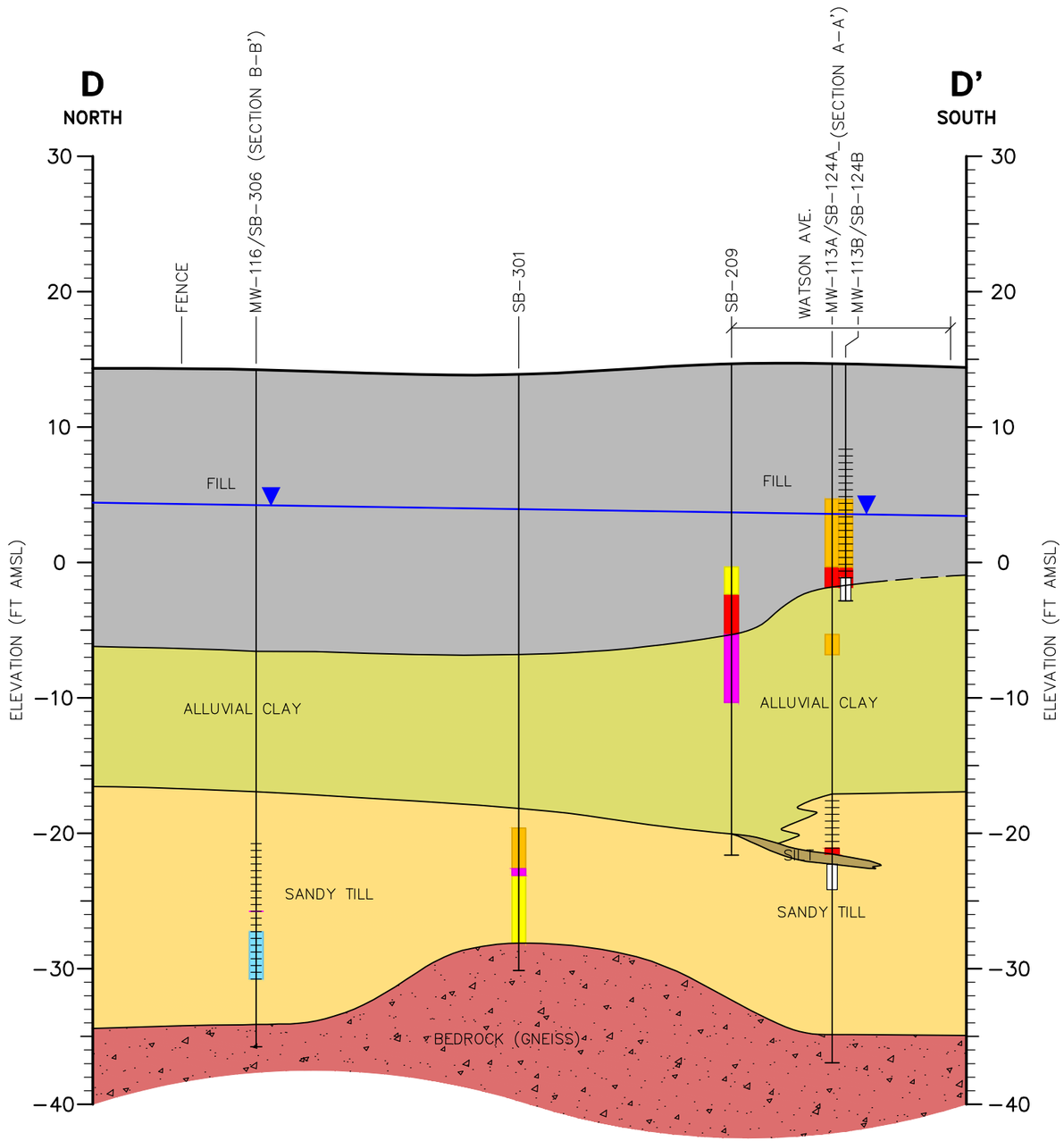
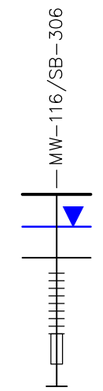




LEGEND:

- WELL OR BORING ID
- GROUND SURFACE
- GROUNDWATER
- LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
- SCREEN
- SUMP
- BOTTOM OF BORING
- UNDIFFERENTIATED FILL
- GRAVEL
- ALLUVIAL CLAY
- GLACIAL TILL (SAND AND SILT)
- SILT
- GNEISS (HARTLAND FORMATION)
- TAR SATURATED
- COATED MATERIAL
- BLEBS, SHEEN
- STAINING, ODOR
- PETROLEUM IMPACTS STAINING, ODORS

NOTES:

1. GROUNDWATER ELEVATIONS AS MEASURED ON 4/28/2014.

VERTICAL EXAGGERATION = 4X

0 10' 20'

VERTICAL SCALE

0 40' 80'

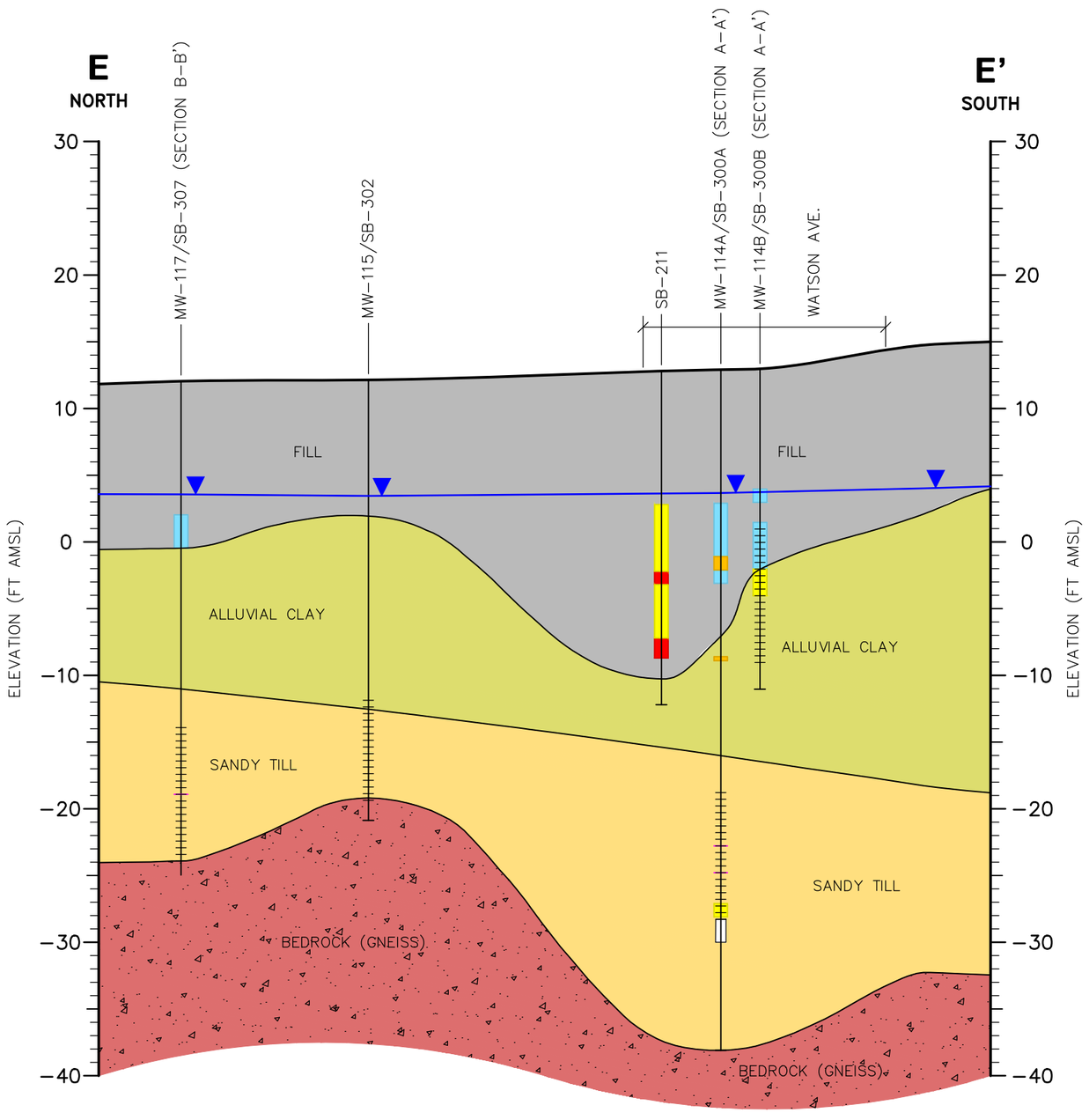
HORIZONTAL SCALE

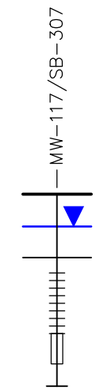
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

GEOLOGIC CROSS SECTION D-D'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
8





LEGEND:

- WELL OR BORING ID
- GROUND SURFACE
- GROUNDWATER
- LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
- SCREEN
- SUMP
- BOTTOM OF BORING
- FILL
- ALLUVIAL CLAY
- GLACIAL TILL (SAND AND SILT)
- GNEISS (HARTLAND FORMATION)
- TAR SATURATED
- BLEBS, SHEEN
- STAINING, ODOR
- PETROLEUM IMPACTS STAINING, ODORS

NOTES:

1. GROUNDWATER ELEVATIONS AS MEASURED ON 4/28/2014.

VERTICAL EXAGGERATION = 4X

0 10' 20'

VERTICAL SCALE

0 40' 80'

HORIZONTAL SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

GEOLOGIC CROSS SECTION E-E'

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FIGURE
9

CITY:SYRACUSE NY GROUP:ENV/IM-DV DB: E. KRAHMER, R. ALLEN PIC: PM/TM: TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
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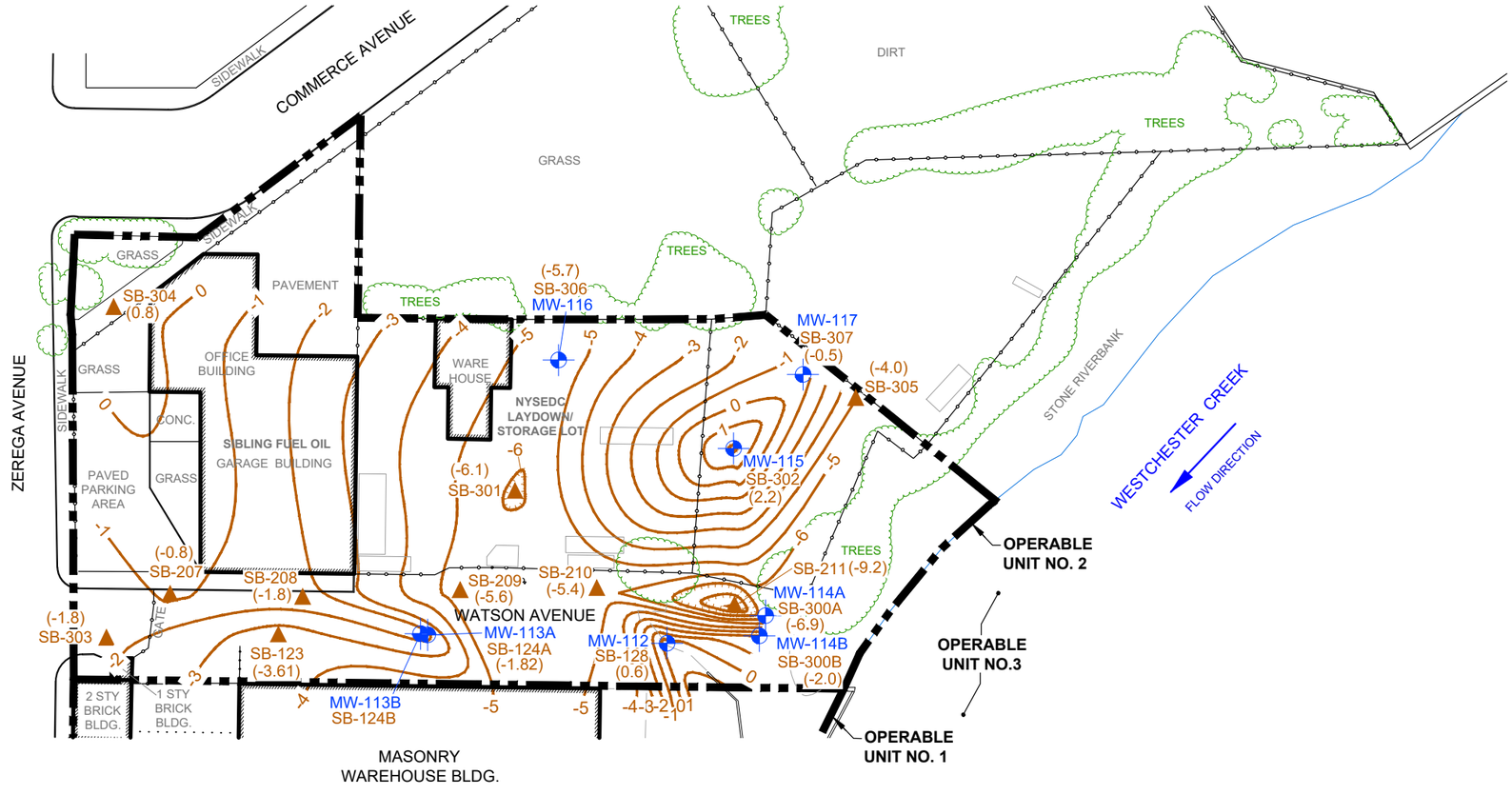

LEGEND:

- CHAINLINK FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- MW-103 — GROUNDWATER MONITORING WELL
- SB-111 — SOIL BORING
- -3 — TOP OF CLAY ELEVATION CONTOUR (FT. AMSL)
- (-9.2) — TOP OF CLAY ELEVATION (FT. AMSL)

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. TOP OF BEDROCK ELEVATIONS BASED ON EXISTING SUBSURFACE BORING LOG.
3. ALL ELEVATIONS REFER TO NAVD 1988 VERTICAL DATUM.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

TOP OF CLAY ELEVATION MAP

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FIGURE 10

CITY: SYRACUSE NY GROUP: ENV/IM-DV DB: E. KRAHMER, R. ALLEN LD: (Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\CON EDISON\Former Zerega Ave. Gas Holder Site\2018\B0043515.0020\01-DWG\RAWP-Fig10-Top of Clay.dwg LAYOUT: 10 SAVED: 5/21/2018 12:45 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 5/21/2018 1:07 PM BY: KRAHMER, ERIC
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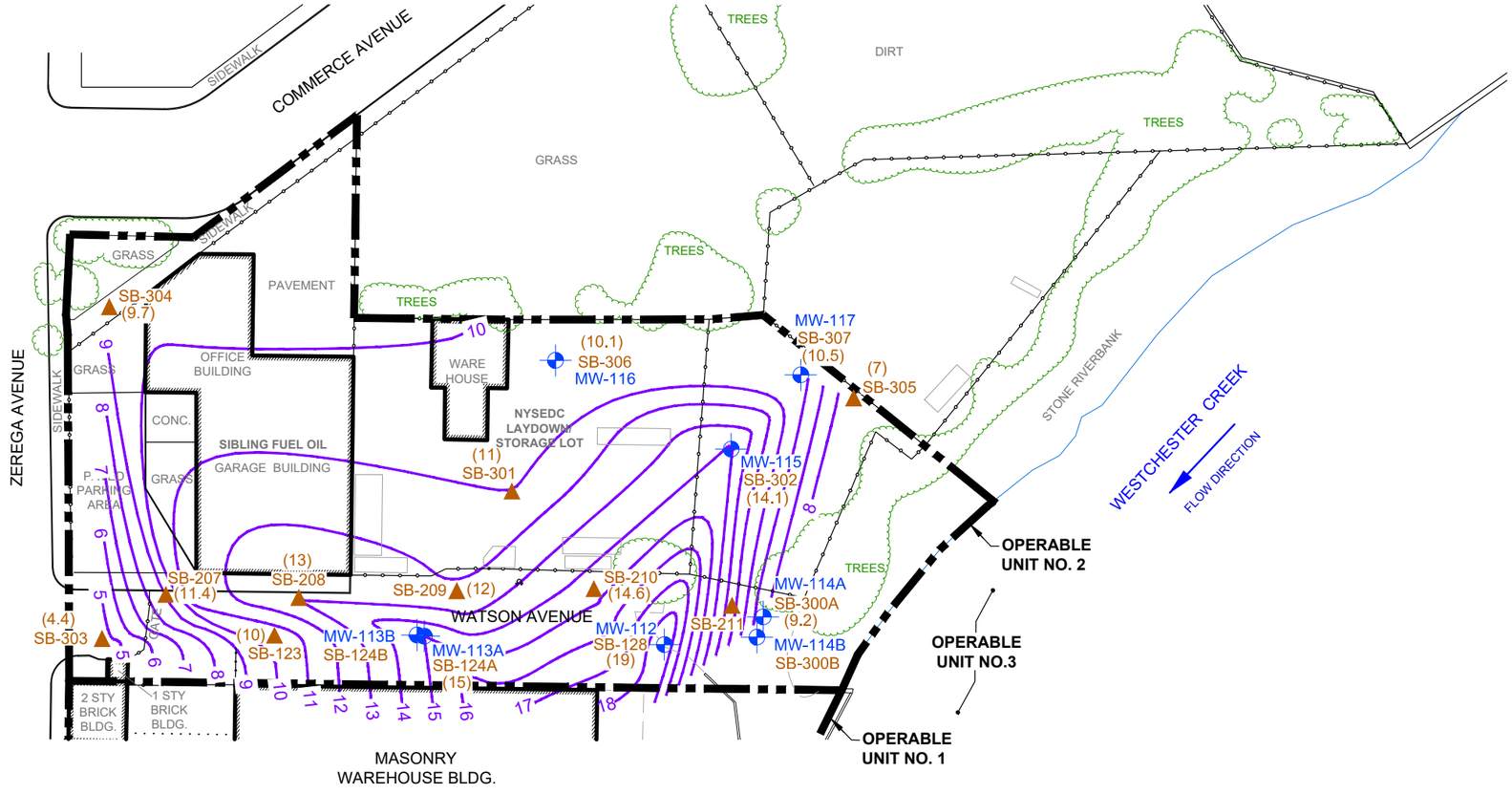

LEGEND:

- CHAINLINK FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- MW-103 GROUNDWATER MONITORING WELL
- SB-111 SOIL BORING
- -18 CLAY ISOPACH
- (14.1) CLAY THICKNESS (FT.)

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. TOP OF BEDROCK ELEVATIONS BASED ON EXISTING SUBSURFACE BORING LOG.
3. ALL ELEVATIONS REFER TO NAVD 1988 VERTICAL DATUM.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

CLAY THICKNESS MAP

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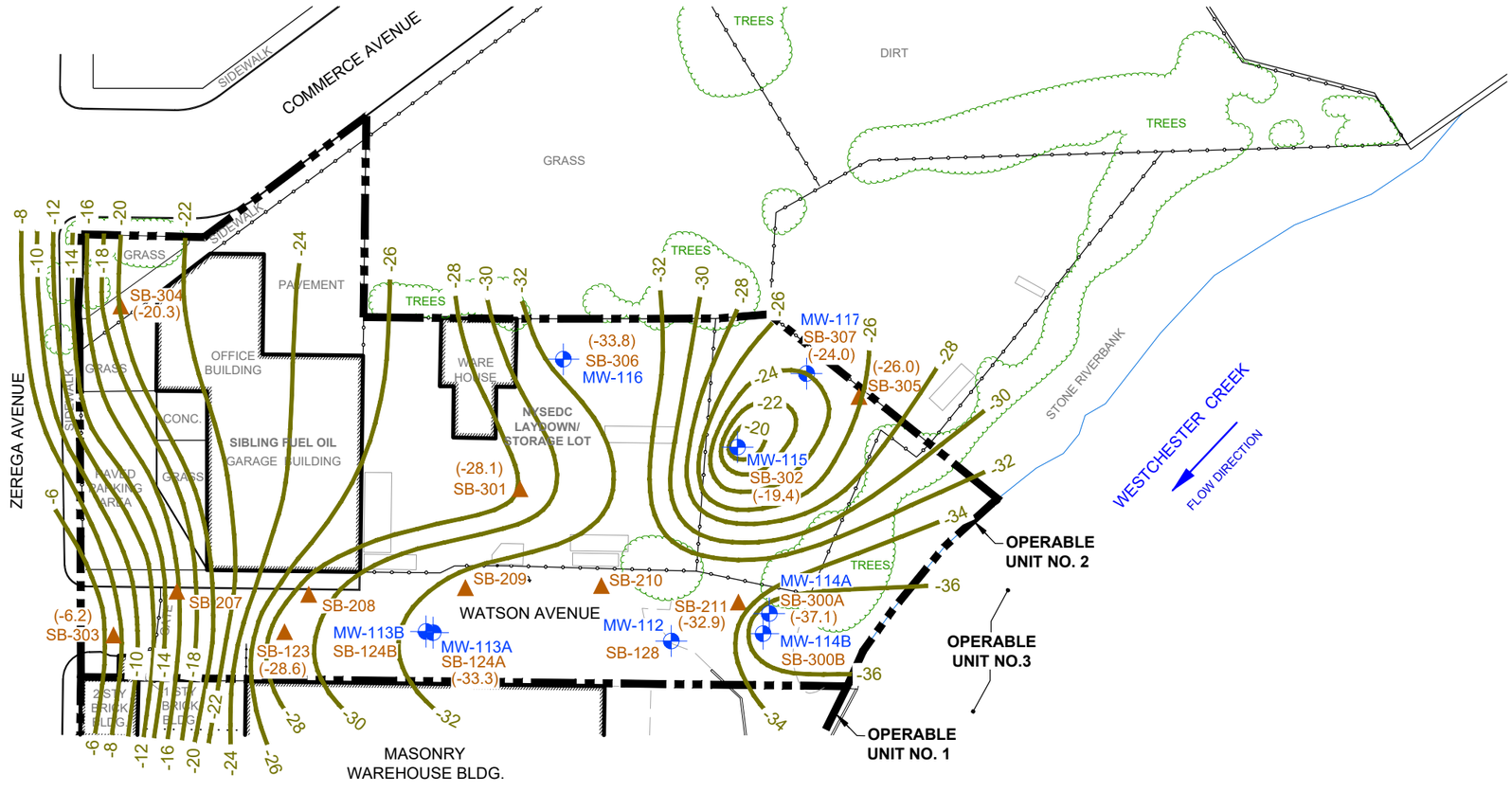
FIGURE 11



LEGEND:

- CHAINLINK FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- MW-103 — GROUNDWATER MONITORING WELL
- SB-111 — SOIL BORING
- -32 — TOP OF BEDROCK ELEVATION CONTOUR (FT. AMSL)
- -33.3 — TOP OF BEDROCK ELEVATION (FT. AMSL)

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. TOP OF BEDROCK ELEVATIONS BASED ON EXISTING SUBSURFACE BORING LOG.
3. ALL ELEVATIONS REFER TO NAVD 1988 VERTICAL DATUM.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

TOP OF BEDROCK ELEVATION MAP

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FIGURE 12

CITY: SYRACUSE NY GROUP: ENV/IM-DV DB: E. KRAHMER, R. ALLEN LD: (Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
C:\Users\EKrahmer\OneDrive - ARCADIS\IBIM 360 Docs\CON EDISON\Former Zerega Ave. Gas Holder Site\2018\B0043515.0020\01-DWG\RAWP-Fig12-Top of Bedrock.dwg LAYOUT: 12 SAVED: 5/21/2018 12:52 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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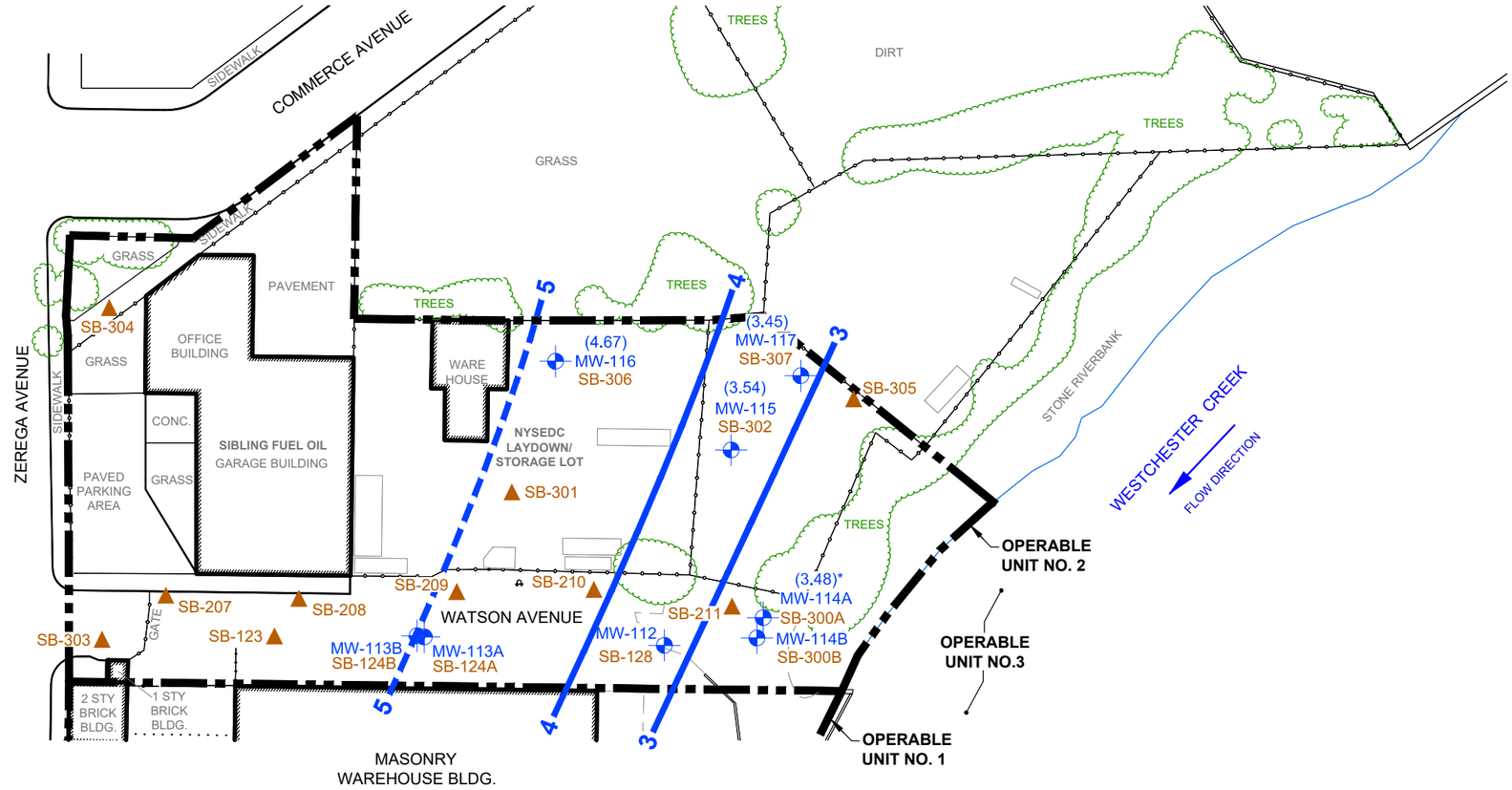
X-Base Map



LEGEND:

- CHAINLINK FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- MW-103 — GROUNDWATER MONITORING WELL
- SB-111 — SOIL BORING
- 5 — WATER TABLE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- (4.67) — WATER TABLE ELEVATION (FEET ABOVE MEAN SEA LEVEL)

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.
3. WATER TABLE ELEVATIONS MEASURED ON 04/28/14.
4. *THE ELEVATION AT MW–114A WAS TIDALLY INFLUENCED DURING THE GAUGING EVENT AND WAS NOT CONTOURED ON THIS FIGURE.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

DEEP OVERBURDEN GROUNDWATER CONTOUR MAP

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FIGURE 13

CITY: SYRACUSE NY GROUP: ENV/IM-DV DB: E. KRAHMER, R. ALLEN LD: (Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
C:\Users\EKrahmer\OneDrive - ARCADIS\BIM 360 Docs\CON EDISON\Former Zerega Ave. Gas Holder Site\2018\B0043515.0020\01-DWG\RAWP-Fig13-Deep Overburden GW.dwg LAYOUT: 13 SAVED: 5/21/2018 12:54 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB
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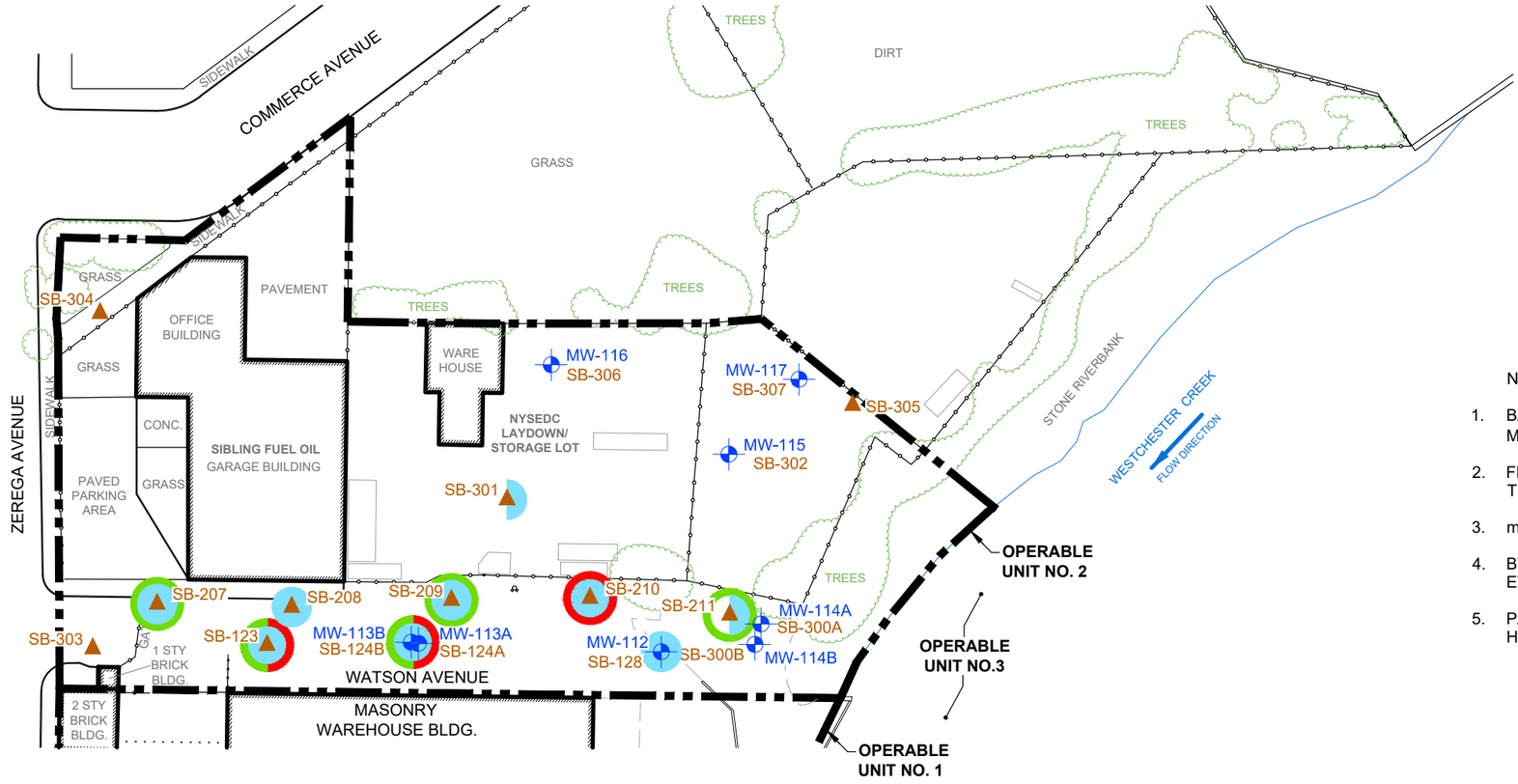

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.
3. mg/kg = MILLIGRAMS PER KILOGRAMS.
4. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
5. PAHs = POLYCYCLIC AROMATIC HYDROCARBONS.

LEGEND:

- CHAINLINK FENCE
- FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- OIL RECOVERY SHED
- OIL/WATER SEPARATOR
- MW-103 GROUNDWATER MONITORING WELL
- SB-111 SOIL BORING
- NAPL ABOVE CLAY
- NAPL BELOW CLAY
- BTEX ABOVE 10 mg/kg
- PAHs ABOVE 500 mg/kg

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

BTEX, PAHs, AND NAPL IN SUBSURFACE SOIL

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FIGURE
14

CITY: SYRACUSE NY GROUP: EnvCAD DB: E. KRAHMER LD: (Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
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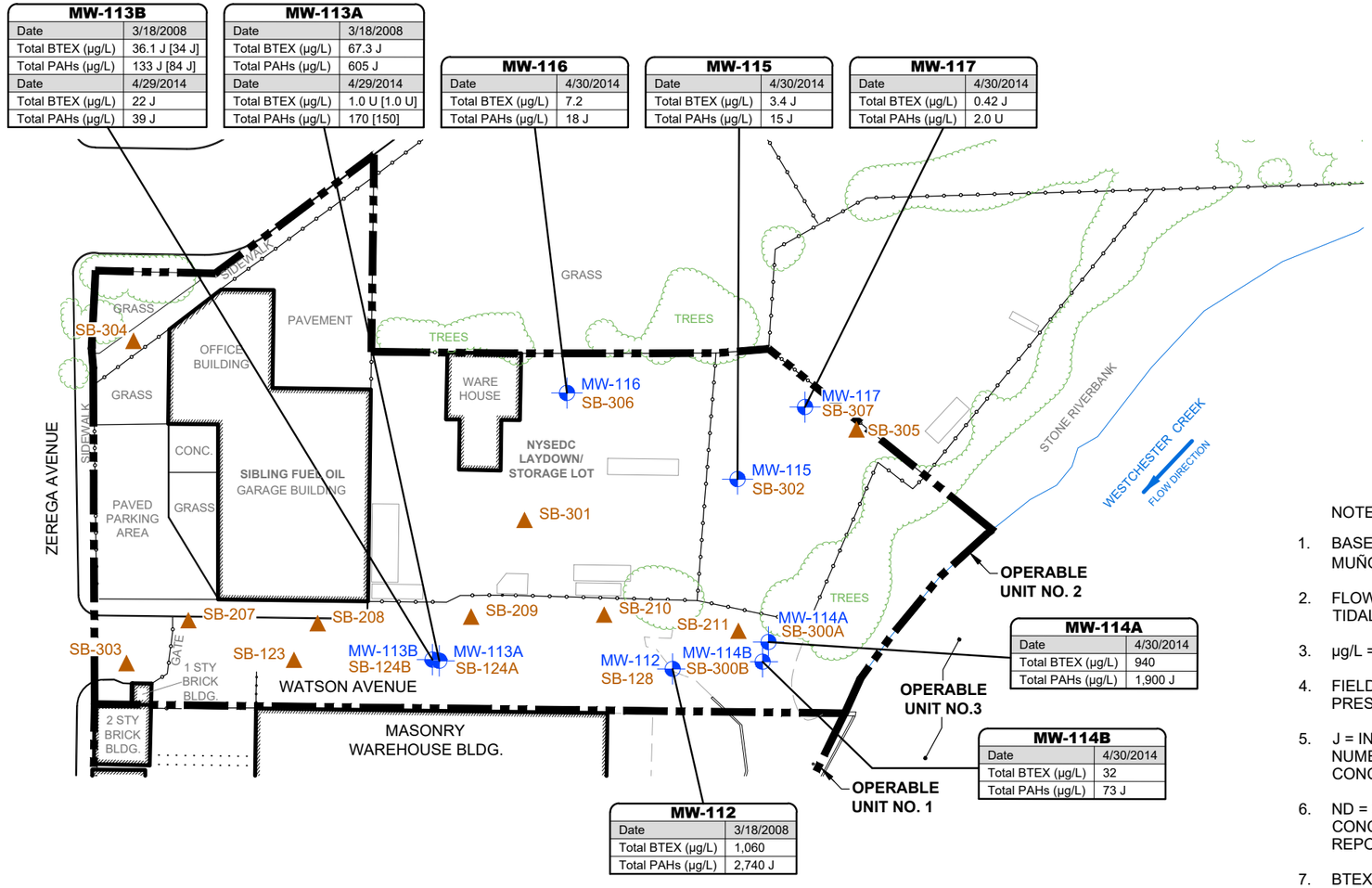
X-Base Map



NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.
3. µg/L = MICROGRAMS PER LITER.
4. FIELD DUPLICATE SAMPLE RESULTS ARE PRESENTED IN BRACKETS [ ].
5. J = INDICATES THAT THE ASSOCIATED NUMERICAL VALUE IS AN ESTIMATED CONCENTRATIONS.
6. ND = CONSTITUENTS NOT DETECTED AT CONCENTRATIONS ABOVE THE REPORTED DETECTION LIMITS.
7. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES.
8. PAHs = POLYCYCLIC AROMATIC HYDROCARBONS.

0 80' 160'

GRAPHIC SCALE

LEGEND:

- CHAINLINK FENCE
- FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- OIL RECOVERY SHED
- OIL/WATER SEPARATOR
- MW-103 GROUNDWATER MONITORING WELL
- SB-111 SOIL BORING

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

TOTAL BTEX AND PAH CONCENTRATIONS FOR GROUNDWATER (µg/L)

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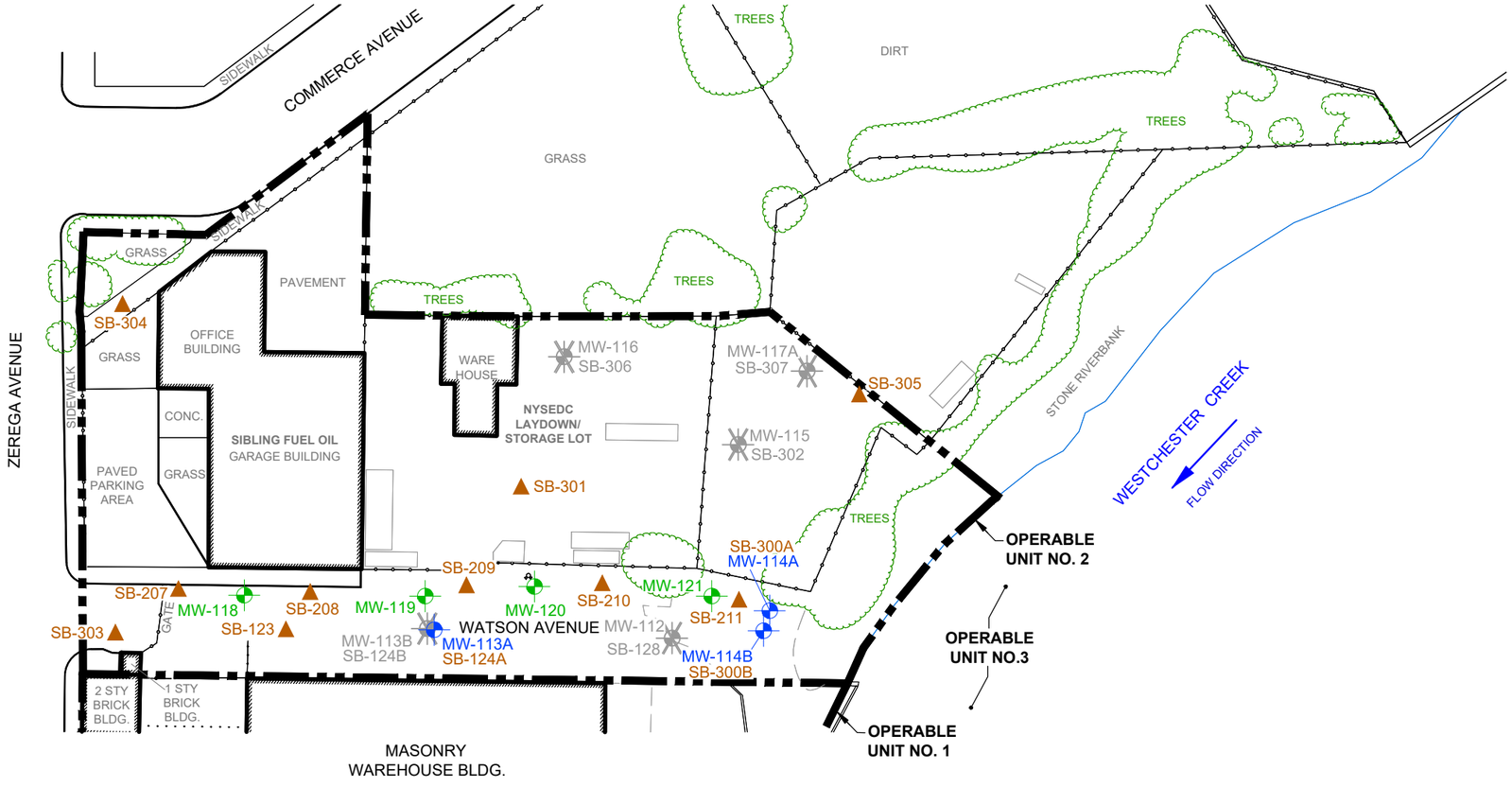
FIGURE 15



LEGEND:

- CHAINLINK FENCE
- OPERABLE UNIT BOUNDARY
- OVERHEAD STRUCTURE
- CATCH BASIN
- MW-118 — PROPOSED NAPL MONITORING/ RECOVERY WELL
- MW-103 — GROUNDWATER MONITORING WELL
- MW-113A — MONITORING WELL TO BE DECOMMISSIONED
- SB-111 — SOIL BORING

NOTES:

1. BASEMAP PREPARED FROM SURVEYS BY MUÑOZ ENGINEERING P.C., 2008 & 2014.
2. FLOW IN WESTCHESTER CREEK IS TIDALLY INFLUENCED.

0 80' 160'

GRAPHIC SCALE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
FORMER UNIONPORT GAS WORKS SITE - OU-2
BRONX, NEW YORK
REMEDIAL ACTION WORK PLAN

PROPOSED REMEDIAL ALTERNATIVE

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FIGURE 16

CITY: SYRACUSE NY GROUP: ENV/IM-DV DB: E. KRAHMER, R. ALLEN LD: (Opt.) PIC: M. MILLER PM/TM: M. JONES TR: D. A. RODRIGUEZ LYR:ON=*;OFF=REF; (FRZ)
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RAWP-Title Block
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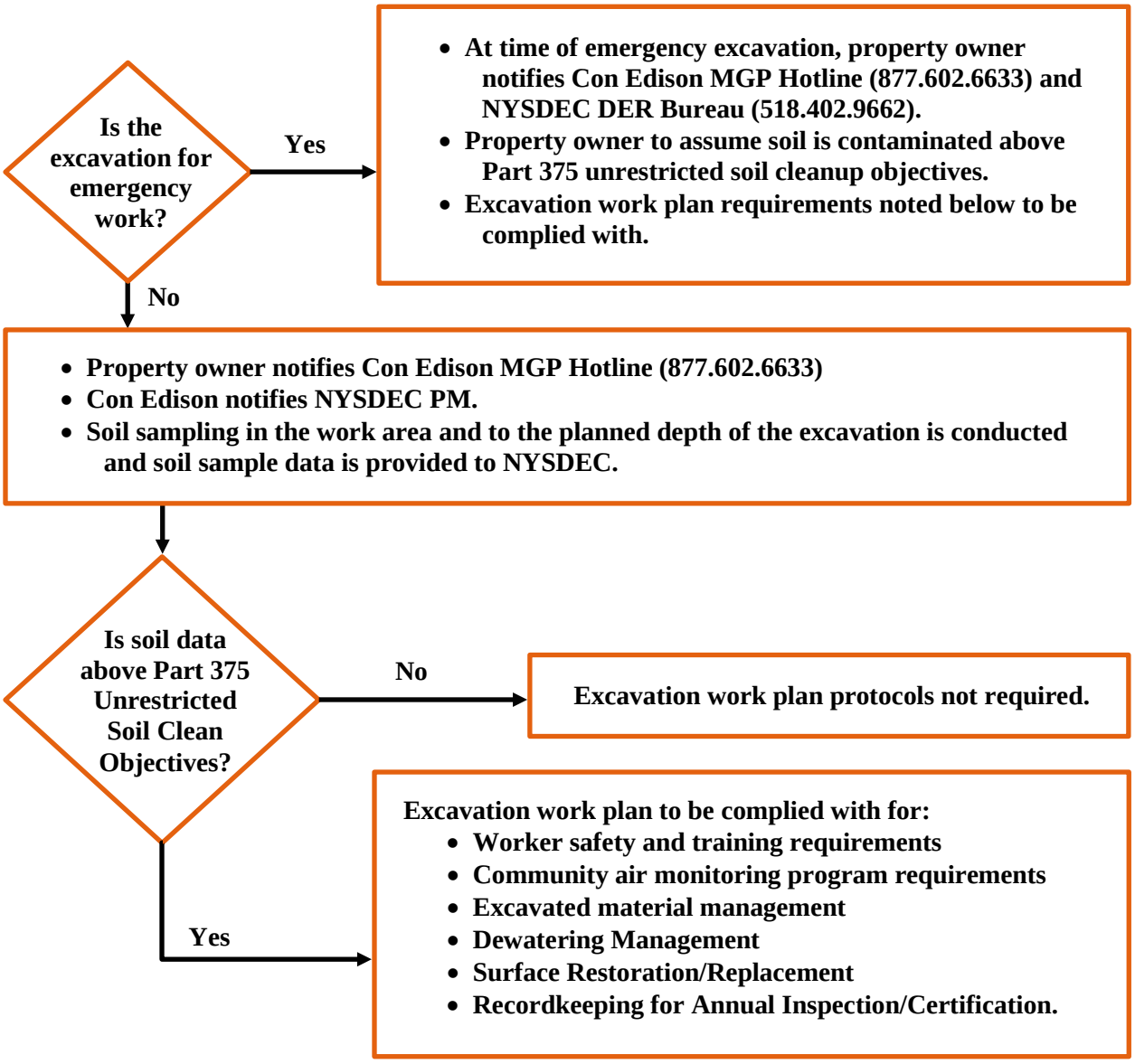
APPENDIX A

Guidelines for Intrusive Activities

APPENDIX A
Remedial Action Work Plan
Consolidated Edison Company of New York, Inc.
Former Unionport Gas Works Site - OU-2
Bronx, New York

INTRUSIVE ACTIVITIES GUIDELINES



APPENDIX B

NYSDOH Generic Community Air Monitoring

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX C

Institutional Controls/Engineering Controls Certification Checklist

APPENDIX D
Remedial Action Work Plan
Consolidated Edison Company of New York, Inc.
Unionport Works Gas Site - OU-2
Bronx, New York

INSTITUTIONAL AND ENGINEERING CONTROL (IC/EC) CERTIFICATION

CHECKLIST Site No. V00553

Site Name: Operational Unit No. 2 of the Unionport Works Site

Site Location: 1066 Zerega Avenue, Bronx, New York

Reporting Period:

Certification Checklist

#	Item	Yes	No
1	Is the information above correct? If NO, include handwritten update above or on a separate sheet.		
2	Has any or all of the site property been sold, subdivided, merged or undergone a tax map amendment during this Reporting Period?		
3	Have any federal, state, and/or local permits (e.g., building permit) been issued at the Sibling Fuel Oil (Tax Block 3888 Lot 5) or NYCEDC (Tax Block 3888 Lot 60) property during this Reporting Period?		
4	Has there been any actual or pending zoning or land-use changes to the Site Management Plan area during this Reporting Period?		
5	Has the periodic site inspection identified any excavation or other disturbance activities that have taken place within the Site Management Plan area during this Reporting Period?		
6	Is any or all of the site currently undergoing development?		
7	Is the current site uses for each of the site properties consistent with the use(s) listed below? A. Sibling Fuel Oil: Industrial B. NYCEDC: Industrial C. WatsonAvenue: Public Right-of-Way		
8	Are all ICs/ECs in place and functioning as designed?		

Notes:

A. If you answered Yes to questions 2 thru 5 above, include documentation or evidence that documentation has been previously submitted included with this certification form.

B. A Corrective Measures Work Plan must be submitted along with this form to address any issues identified.

Control Certification Statement

For each Institutional or Engineering Control listed above, I certify by checking "Yes" below that all of the following statements are true:

A. The institutional and/or engineering controls employed at the site are:
   i. Unchanged since the date that the control was put in place, or was last approved by the Department;
   ii. In place and effective;
   iii. Performing as designed;
   iv. Nothing has occurred that would impair the ability of the controls to protect public health and environment; and
   v. Nothing has occurred that constitutes a violation or failure to comply with any operation and maintenance plan for such controls.

B. Access to the site will be provided to the Department to evaluate the remedy and verify continued maintenance of such controls.

Yes	No
☐	☐

IC/EC
CERTIFICATIONS Site
No. V00553

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I _____ at _____
(print name) (print business address)

am certifying as Owner (Owner or Remedial Party) for the Site named in the Site Information Section of this form

_____ _____
Signature of Owner or Remedial Party Rendering Certification Date

QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE

I _____ at _____
(print name) (print business address)

am certifying as a Qualified Environmental Professional for the

_____
(Owner or Remedial Party)

for the Site named in the Site Information Section of this form.

_____ _____ _____
Signature of Qualified Environmental Professional, Owner or Remedial Party, Rendering Certification Stamp (if Required Date

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