PROPOSED REMEDIAL ACTION PLAN
Brooklyn Navy Yard 13-Acre Parcel
Operable Unit No. 1
Brooklyn, Kings County, New York
Site No. 224019A

February, 2009

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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Operable Unit No. 1

Brooklyn, Kings County, **New York**
Site No. 224019A
January, 2009

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the Brooklyn Navy Yard 13-Acre Parcel Operable Unit No. 1. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this proposed remedy. As more fully described in Sections 3 and 5 of this document, a transformer fire, waste handling practices and general filling of the area has resulted in the disposal of hazardous wastes, including polychlorinated biphenyls (PCB), metals and semi-volatile organic compounds (SVOC). These wastes have contaminated the soils at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to site soils.

To eliminate or mitigate these threats, the Department proposes excavation of hot spots and placing a protective cover over the site.

The proposed remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially 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.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The Department will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The Department has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to 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 document is a summary of the information that can be found in greater detail in the September, 2006 "Remedial Investigation (RI) Report," the June, 2008 "Feasibility Study (FS) Report," and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

New York State Department of Environmental Conservation 625 Broadway Albany, NY 12233-7014 Attn: Jonathan Greco, Project Manger (518) 402-9694 or, 1-888-212-9586	Monday though Friday: By appointment
Brooklyn Community Board #2 Shirley McRae, Chairperson 350 Jay Street, 8th floor Brooklyn, NY 11201	Monday through Friday: 9:00 AM – 5:00 PM
Brooklyn Public Library Central Library Grand Army Plaza Brooklyn, NY 11238 (718) 230-2100	Monday 9 AM – 6 PM Tues – Thurs 9 AM – 9 PM Friday 9 AM – 6 PM Saturday 10 AM – 6 PM
Brooklyn Community Board #1 Mr. Gerald A. Esposito - District Manager 435 Graham Avenue Brooklyn, NY 11211 (718) 389-0009	Monday through Friday: 9:00 AM – 5:00 PM

The Department seeks input from the community on all PRAPs. A public comment period has been set from February 12, 2009 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for February 25, 2009, in Building 292 at the Brooklyn Navy Yard Development Corporation (BNYDC), 63 Flushing Ave., Brooklyn, NY, beginning at 7:00 PM.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Mr. Greco at the above address through March 16, 2009.

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Brooklyn Navy Yard 13-Acre Parcel site is on the north-east portion of the Brooklyn Navy Yard

Development Corp. (BNYDC) Industrial Park and is operated by the New York City Department of Sanitation. The site is bordered by the East River on the north and west, by Kent Avenue on the east, and by the remainder of the BNYDC industrial park on the south (see figure 1).

The site includes a barge basin, the Building 419 transformer substation, two former drum storage areas, a former boat shop area and a former coal gasification plant area. The surrounding area includes industrial, commercial and residential uses.

The site is generally comprised of fill material (e.g., coal ash, demolition debris, etc.), now overlain by pavement and buildings. Groundwater occurs at approximately six-feet below grade and groundwater flow is towards the Barge Basin locally and to the East River regionally.

Operable Unit (OU) No. 1, which is the subject of this document, consists of approximately 9.5 acres of the 13 acre site and includes the two former drum storage areas, a railroad siding area and the Building 419 transformer substation. An operable unit represents 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 the site contamination. The remaining operable unit for this site is the "Former Brooklyn Navy Yard MGP" site (a.k.a., OU 2 or the "Nassau Works MGP" site), which occupies approximately 3.5 acres of the 13-Acre Parcel. This portion of the site formerly housed the Nassau Works manufactured gas plant and is currently being investigated for contamination related to that use. Wastes associated with OU 2 of the 13-Acre Parcel are not subject to this proposed plan, but will be addressed in a separate PRAP in the future.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Operable Unit 1 of the 13-Acre Parcel contains four distinct areas of investigation: Drum Storage Area A; Drum Storage Area B; the Railroad Siding area, and; Building 419 (see figure 2). The following is a brief operational and disposal history of each area:

Drum Storage Area A:

Former Drum Storage Area A is located in the southeastern corner of the site and was reportedly used to store a roll-off container filled with five-gallon drums that were labeled as containing various solvents, lubricating oils and cutting oils. The exact location of Drum Storage Area A is uncertain, however, a 1988 Environmental Assessment report placed it in the area shown on figure 2. The concern at this area was that drums of hazardous materials may have leaked and caused contamination to soils underlying pavement.

Drum Storage Area B:

Former Drum Storage Area B is located at the northwestern end of the Railroad Siding Area and was reportedly used to store approximately a dozen 55-gallon drums containing waste oils. As with Former Drum Storage Area A, the location of Former Drum Storage Area B is based upon estimated locations provided in a 1988 Environmental Assessment. The concern at this area was that drums of hazardous materials may have leaked directly onto the compacted gravel surface of the former drum storage area.

Building 419:

A primary contaminant leading to the listing of this site on the *Registry of Inactive Hazardous Waste Sites* was PCB released during a 1986 transformer fire at Building 419, which is an enclosure formerly used as a transformer substation. The "building" has no roof and the "floor" consists of individual concrete slabs, on which the transformers were formerly located, separated by exposed earth and gravel. In June 1986, there was an explosion and subsequent fire at one of the PCB-containing transformers located within Building 419. Building 419 was decontaminated, and contaminated soils were removed from the immediate vicinity of the transformer. The investigation of this area focused on identifying PCB contamination remaining following the earlier cleanup.

Railroad Siding Area:

The Railroad Siding Area is located along the southwestern portion of the site and runs in a northwest to southeast direction. Sampling in this area initially occurred during a 1988 Environmental Assessment and indicated the presence of PCBs at low concentrations in a single composite sample collected. This resulted in further exploratory borings and test pits in the area to investigate the potential presence of PCBs, as well as lead and semi-volatile organic compounds. The investigation of this area focused on confirming earlier results, as well as filling in data gaps.

3.2: Remedial History

In June of 1986, a transformer within the Building 419 enclosure ruptured and caught fire. A partial cleanup of that release occurred shortly thereafter, however, documentation of that cleanup is not complete. No other cleanups are documented to have occurred within the boundaries of Operable Unit 1.

In 2001, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

SECTION 4: ENFORCEMENT STATUS

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

The Department and the City of New York entered into a Consent Order for Operable Unit 1 on October 12, 2006. The Order obligates the responsible party to implement a full remedial program. Keyspan Energy Corporation entered into a separate Consent Order on October 12, 2006 which commits it to the investigation and remediation of Operable Unit 2. The two orders together replace an earlier 1996 order with New York City alone. That order predated the site being listed on the hazardous waste site registry, and was not as expansive in remedial scope.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and/or the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between February, 2005 and September, 2006. The field activities and findings of the investigation are described in the RI report.

The investigation encompassed a detailed vetting of earlier studies and data, as well as the collection of new soil samples, groundwater samples, surface water/sediment samples, and soil vapor samples.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the site soil, groundwater, surface water, sediments and soil vapor contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the Department's Cleanup Objectives found in 6 NYCRR Part 375-6, as well as in the "Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels."

- Sediment SCGs are based on the Department's "Technical Guidance for Screening Contaminated Sediments."

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

As described in the RI report, many soil, groundwater, soil gas, and surface water/sediment samples were collected to characterize the nature and extent of contamination. As seen in Tables 1-a through 1-g , the main categories of contaminants that exceed their SCGs are semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganics (metals). For comparison purposes, where applicable, SCGs are provided for each medium.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for soil and sediment. Air samples are reported in micrograms per cubic meter ($\mu g/m^3$).

Figure 3 and Tables 1-a through 1-g summarize the degree of contamination for the contaminants of concern in soil, groundwater, surface water/sediment, and soil vapor and compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Surface Soil

Drum Storage Area A: This area is generally covered by a layer of compacted gravel and does not readily support vegetation, and therefore does not contain "surface soil." All soil samples collected in this area will be considered "Subsurface Soil," and are discussed in a separate section.

Drum Storage Area B: This area is generally covered by a layer of compacted gravel and does not readily support vegetation, and therefore does not contain "surface soil." All soil samples collected in this area will be considered "Subsurface Soil," and are discussed in a separate section.

Railroad Siding Area: This area is currently covered by a layer of compacted gravel and does not readily support vegetation, and therefore does not contain "surface soil." All soil samples collected in this area will be considered "Subsurface Soil," and are discussed in a separate section.

Building 419: Building 419 is currently the only area with exposed soils. A total of 43 surface soil samples (i.e., soils within the top two or three inches) were taken and analyzed primarily for PCB, however, of those samples, five were analyzed for a broader suite of compounds, including VOCs, SVOCs, pesticides and metals for further characterization of the area. PCBs were found to be above one part per million in soils within this area and were determined to be the contaminant of concern at this location. Figure 3 and Tables 1-a through 1-d provide details on the analytical results for this area and the entire site.

Surface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Subsurface Soil

Drum Storage Area A: The subsurface soil investigation of Drum Storage Area A consisted of eight samples for a broad suite of compounds, including VOCs, SVOCs, pesticides, PCB and metals, as well as an additional eight samples which targeted lead only. Most compounds detected were at concentrations below those in historic fill at other areas of the Brooklyn Navy Yard, however, one sample within the area did reveal leachable lead at levels which are considered hazardous. The highest total lead concentration within this area was 1100parts per million (ppm), which is well above the unrestricted reuse criteria of 63 ppm, but only marginally above the commercial cleanup goal of 1000 ppm (see 375-6.8). No PCB were detected above one part per million in the area. Figure 3 and Tables 1-a through 1-d provide greater detail on the analytical data for this area.

Drum Storage Area B: The subsurface soil investigation of Drum Storage Area B consisted of nine samples for a broad suite of compounds, including VOCs, SVOCs, pesticides, PCB and metals, as well as an additional 23 samples which targeted SVOCs, PCB and metals only. This area contained concentrations of lead and PCB considerably higher than those in historic fill at other areas of the Brooklyn Navy Yard, with PCB levels as high as 27 ppm and lead levels as high as 5500 ppm. SVOCs were also found at relatively high levels in some samples from within this area, but were generally less significant than the elevated lead and PCB values. Figure 3 and Tables 1-a through 1-d provide greater detail on the analytical data for this area.

An Interim Remedial Measure (IRM) was undertaken at Drum Storage Area B in the summer of 2008 in an effort to address the soil contamination identified. That IRM is further discussed in section 5.2, below.

Railroad Siding Area: The subsurface soil investigation of the Railroad Siding Area consisted of 21 samples for a broad suite of compounds, including VOCs, SVOCs, pesticides, PCB and metals, as well as an additional 33 samples which targeted SVOCs and metals only. No pesticides or VOCs were detected, and PCBs were not found in this area at levels generally considered a concern (e.g., only one PCB sample, with a concentration of 1.5 ppm, was above the unrestricted reuse and commercial standards of .1 and 1 ppm, respectively). Metals and SVOC contamination was detected above commercial and unrestricted soil cleanup objectives at several sample locations; however, the distribution was sporadic and not indicative of a "release," but more likely representative of sampling within an area that consists of historic fill. Figure 3 and Tables 1-a through 1-d provide greater detail on the analytical data for this area.

Building 419: The subsurface soil investigation of the Building 419 area consisted of 31 samples for a broad suite of compounds, including VOCs, SVOCs, pesticides, PCB and metals, as well as additional rounds of sampling targeting a more select suite of compounds (e.g., 44 additional samples for PCB only, 30 additional samples for lead only, as well as 11 more samples each for SVOCs and metals). Results indicated that VOCs and pesticides were not of concern, with only minor excursions above cleanup criteria established for unrestricted reuse. Metals (predominately lead) and SVOCs were often above unrestricted criteria; however, when assessed against commercial cleanup criteria, the exceedances are sporadic and do not appear indicative of a "release," but more likely representative of sampling within an area that consists of historic fill. PCBs are present at levels above unrestricted and commercial use criteria within the former substation, with the highest subsurface result for total PCB being 81 ppm. Figure 3 and Tables 1-a through 1-d provide greater detail on the analytical data for this area.

Subsurface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Groundwater

During the final stages of the RI, groundwater samples were collected in up-gradient and down-gradient monitoring wells to supplement previously existing groundwater data. Existing wells MW-4SR and MW-4DR, and replacement shallow wells (these wells replaced earlier wells that had been destroyed) MW-3SR, MW-5SR, MW-6SR and MW-12S were sampled and analyzed for the full Target Compound List (VOCs, SVOCs, pesticides/PCBs, and metals including cyanide).

Analytical results exceeding groundwater quality criteria are summarized in Table 1-e. These results represent groundwater contained within the urban fill material and are consistent with the analytical results obtained from these fill deposits as described in the previous sections. As described further below, both the groundwater and urban fill contain metals and a limited number of SVOCs. No pesticides or PCBs were observed above criteria in groundwater. With respect to VOCs, only xylene was above NYSDEC Part 703 criteria (ranging from 21-41 ppb) in one well (MW-6SR). Metals observed above their respective criteria included antimony, lead, iron, manganese, selenium and sodium. Levels of some metals observed during the earlier stages of the RI may be related to high particulate matter in the water sample. For example, recently collected groundwater samples in replacement well MW-5SR had considerably lower metals concentrations than previously observed in the original well at that location, and this is believed to be attributable to better sampling technique and well construction than was used in the past. Further support for the conclusion that high particulate matter in samples was the cause of elevated concentrations of metals in groundwater can be found by comparing filtered and unfiltered groundwater samples. For example, lead concentrations above criteria were observed in the unfiltered sample while only low concentrations were observed in the filtered

sample. A small number of SVOCs were also observed to have concentrations moderately above screening criteria.

In general, observed concentrations of contaminants in groundwater do not indicate a significant source of groundwater contamination due to a release or waste management at OU 1. However, there does appear to be minor impact to groundwater on the OU 1 parcel, presumably due to historic operations at the site, as well as the presence of historic fill. No source area of contamination relative to these minor groundwater impacts was found during the investigation.

Groundwater contamination identified during the RI/FS will be addressed in the remedy selection process.

Sediments

To investigate whether surface runoff from the Brooklyn Navy Yard has contaminated sediment in the adjoining waterway, three sediment samples were collected on the perimeter of the barge basin and compared to sediment quality data collected previously from the center of the basin. Concentrations of metals in the new samples were similar to or lower than those observed in samples collected near the center of the basin, indicating that overland flow of contaminants was not significantly impacting sediments.

Additionally, concentrations of contaminants observed within the barge basin were not found to be significantly different from those prevalent throughout the region. Both metal and SVOC concentrations in the barge basin sediments were generally comparable to a background sample collected near the mouth of the East River, as well as to samples collected from nearby Wallabout basin, indicating that observed contaminant concentrations reflect the urban nature of local waterways rather than impacts from the site. Table 1 provides greater detail on the analytical data for this area.

No site-related sediment contamination of concern was identified during the RI/FS. Therefore, no remedial alternatives need to be evaluated for sediment.

Soil Vapor/Sub-Slab Vapor/Air

To assess the potential vapor intrusion pathway (there are currently no inhabitable structures on-Site), a screening-level soil vapor investigation was performed at the Site. Two soil vapor samples were collected in each of the former drum storage areas and in the vicinity of monitoring well MW-6 within the Railroad Siding Area, and three soil vapor samples were collected in the vicinity of Former Building 419.

Soil gas results revealed three constituents detected in soil gas (methylene chloride, tetrachloroethene, and trichloroethene) at levels above the New York State Department of Health (NYSDOH) guidance values. These contaminants were also reported at low levels in several soil samples.

Table 1-g provides greater detail on the analytical data for this area.

Soil vapor contamination identified during the RI/FS will be addressed in the remedy selection process.

5.2: 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 completion of the RI/FS.

An IRM soil removal was performed in the vicinity of Drum Storage Area B during the summer of 2008 in an effort to ready the area for planned commercial development. The IRM targeted anomalously high lead and PCB concentrations in soil found during the RI. Contaminated soils were excavated and disposed off-site in accordance with state and federal law. Following the initial removal, samples were taken from the side walls and bottom of the excavation and results were compared to the cleanup objectives established for the IRM (i.e., .1 ppm PCB, and 400 ppm lead). End point samples were determined to have achieved the goals of the IRM, and an IRM closeout report was submitted to the NYSDEC in December, 2008. The IRM is considered to have successfully removed the most contaminated soils at the Drum Storage Area B portion of the site.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 6.0 of the RI report. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

On-site soil is contaminated with semi-volatile organic compounds, polychlorinated bi-phenyls (PCB) and metals. Exposure to PCB and lead contaminated soil has been minimized by the excavation and off-site disposal of PCB and lead hot spots. Contact exposure to remaining site-related contamination is unlikely since it is located at depth or beneath concrete.

On-site groundwater is contaminated with volatile organic compounds, semi-volatile organic compounds and metals. Exposure to site-related contaminants in drinking water is not expected since the area is served with public water and is routinely tested prior to distribution.

On-site soil vapor is contaminated with volatile organic compounds. Exposure to site-related contaminants in indoor air via vapor intrusion is not a current exposure pathway since there are no buildings on the site. If the site is developed in the future, vapor intrusion will be a potential exposure pathway.

On-site sediment in the barge basin is contaminated with pesticides, semi-volatile organic compounds and metals. These contaminants do not appear to be site-related and the concentrations are similar to other sediment samples collected in the region. Exposure to contaminated sediment in the basin is not expected since the area is not used for recreational purposes and access to the site is largely restricted to on-site workers.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

In general, observed concentrations of contaminants in groundwater at OU 1 do not indicate a significant source of groundwater contamination due to a release or waste management at OU 1. However, there are minor excesses of groundwater standards found sporadically on the OU 1 parcel, presumably due to historic operations at the site, as well as the presence of historic fill. No source area of contamination relative to these minor groundwater impacts was found during the investigation of OU 1.

Significant source areas of contamination have been found on the OU 2 portion of the site, and impacts to groundwater from those sources will be addressed in a future OU 2 remedy.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to PCBs, SVOCs and metals in site soils above soil cleanup objectives established in 6 NYCRR Part 375-6;
- exposures of persons at or around the site to metals and SVOCs in groundwater above criteria established in 6 NYCRR Part 703.5 and 10 NYCRR Part 5;
- exposures of persons at or around the site to VOCs in soil vapor at concentrations in excess of guidance criteria.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for Operable Unit No. 1 of the Brooklyn Navy Yard 13-Acre Parcel were identified, screened and evaluated in the FS report which is available at the document repositories established for this site.

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

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils, groundwater, and soil vapor at the site. Only those alternatives that passed initial screening in the FS are presented here.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Site-Wide Soil Excavation

Present Worth: $11,128,500
Capital Cost: $11,128,500
Annual Cost: .....$ 0

Alternative No. 2 would provide for removal of soils with concentrations of constituents above the Part 375-6 unrestricted use cleanup criteria, which based on the presence of historic fill, is site-wide. Excavated soil would be transported off-site for treatment and/or disposal. This alternative would achieve the remedial action objective of preventing direct contact to unacceptable levels of metals, PCBs, and SVOCs in soil by removing the contaminants from the site.

The components of this remedy would include:

- Site clearing. Various surface structures (i.e., structure or structure remnants, curbs, utilities, etc.) would be removed to facilitate implementation of excavation.

- Excavation of soils above the unrestricted use soil cleanup criteria. For the purpose of estimating the cost of this alternative, excavation depth is estimated to be 6 feet below grade, which is the depth of groundwater. Excavated soils would be stockpiled on site to determine disposal requirements. It is assumed that the site soils would be disposed of as non-hazardous waste, except for the area where lead was detected above the TCLP criterion in Former Drum Storage Area A and a small area of PCB impacted soil above 50 ppm in the vicinity of Former Building 419.

- Post excavation soil sampling to confirm remedial goals were achieved;

- Backfill of excavation with certified clean fill, as per 6 NYCRR Part 375-6.7(d).

- Post excavation groundwater sampling. The removal of all contaminated soil, including historic fill, should result in the attenuation of any groundwater contamination. Post excavation groundwater sampling will be performed to confirm this assumption.

Alternative 3: Site-Wide Cover

Present Worth: $2,252,000
Capital Cost: $1,213,000
Annual Costs:
(Years 1-5): $53,000
(Years 6-30): $53,000

With Alternative No. 3, a protective cover would be placed over the entire site. This alternative would achieve the remedial action objective of preventing direct contact to unacceptable levels of metals, PCBs, and SVOCs in soil by placing a protective cover on the site to eliminate the exposure pathway.

The components of this remedy would include:

- Site Clearing. Site clearing would consist of removal of surface structures (e.g., Former Building 419, fences, etc.) to facilitate installation of a cover;

- Cover Construction. A cover would be installed site wide within the boundaries of Operable Unit One of the Brooklyn Navy Yard parcel. A soil cover would be constructed over all vegetated areas to prevent exposure to contaminated soils. The one-foot thick cover would consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the Division of Environmental Remediation's criteria for backfill, as per 6 NYCRR Part 375-6.7. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete at least 6 inches thick;

- Site Restoration. Surface structures removed for installation of the cover would be restored as appropriate (e.g., fences);

- Development of a site management plan which would include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation below the soil cover's demarcation layer, pavement, or buildings. Excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion into any buildings developed on the site, including the mitigation of any impacts identified; (c) identification of any use restrictions on the site; and (d) provisions for the continued

proper operation and maintenance of the components of the remedy.

- Imposition of an institutional control in the form of an environmental easement that would require (a) limiting the use and development of the property to commercial use, which would also permit industrial use; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

The estimated costs for this alternative are based on capital costs for the site clearing, cover installation and site restoration. Capital costs to establish an environmental easement are based on experience. Annual maintenance costs are included for the cover, which would include patching cracks as necessary and pavement sealing on a bi-annual basis. In addition, annual costs include annual certification for institutional/engineering controls that would remain for the Site.

Alternative 4: Localized Soil Excavation and Site-Wide Cover

Present Worth: $2,279,000
Capital Cost: $1,240,000
Annual Costs:
(Years 1-5): $53,000
(Years 6-30): $53,000

Alternative No. 4 combines Alternative Nos. 3 with limited soil excavation to remove hot-spots of contamination which are the result of site-related activities. This alternative would achieve the remedial action objective of preventing direct contact to unacceptable levels of metals, PCBs, and SVOCs in soil by placing a cover on the site to eliminate the exposure pathway. In addition, this alternative recognizes the Department's preference to restore a site to pre-release conditions where feasible. Prior to placement of the cover, soil containing lead exceeding 5 mg/l in TCLP analysis (a regulatory threshold to characterize a waste as hazardous) would be excavated and disposed of. Also prior to placement of the cover, soil containing PCBs at a level greater than 10 ppm would be removed and disposed off-site. Recognizing that a cover would be placed on the site after soil removal, this remedy would be consistent with a "1 and 10" remedy for the PCB contamination (no greater than 1 ppm PCB at the surface and 10 ppm PCB at depth), which has been a Department presumptive remedy for PCB contaminated sites for almost twenty years (see TAGM 4046). It should be understood that even with the removal of elevated PCBs and lead, the site-wide cover would be still be required due to the presence of historic fill, which contains contaminants at levels which do not allow for unrestricted direct contact.

The components of this remedy would include:

- Site Clearing. Site clearing would consist of removal of surface structures (e.g., Former Building 419, fences, etc.) to facilitate installation of a protective cover;

- Excavation of soil containing PCBs at greater than 10 ppm and/or TCLP lead (>5 mg/l in extract). Area and depth of excavation would be as indicated in Figure 4. Excavated soils would be stockpiled on site to confirm disposal requirements. For the cost of this alternative, it is assumed that the site soils will be disposed of as non-hazardous waste, except for the area of lead TCLP

exceedance in Former Drum Storage Area A and a small area of PCB-impacted soil above 50 ppm in the Former Building 419 area;

- Post excavation soil sampling to confirm remedial goals were achieved;
- Backfill of excavation with certified clean fill;
- All remaining components of Alternative 3, including a site wide cover, a site management plan, and environmental easements as described above.

The estimated costs for this alternative are based on capital costs for the site clearing, soil excavation and disposal, cover installation and site restoration. Soil disposal costs are based on experience. In addition, capital costs to establish an environmental easement are based on experience. Annual maintenance costs are included for the cover, which would include patching cracks as necessary and pavement sealing on a bi-annual basis. In addition, costs include annual certification for institutional/engineering controls that would remain for the Site. Annual maintenance costs are converted to a net present worth using a discount rate of three percent over a period of 30 years.

Alternative 5: Localized Soil Excavation Including PCBs to the Part 375-6 Commercial Critera, and Site-Wide Cover

Present Worth: $2,615,000
Capital Cost: $1,576,000
Annual Costs:
(Years 1-5): $53,000
(Years 6-30): $53,000

Alternative No. 5 is similar to Alternative No. 4 except that the criterion for PCB soil cleanup would be 1 ppm. The 1 ppm criterion represents the SCG for PCBs at commercial sites under 6NYCRR Part 375-6. Area and depth of excavation would be as shown in Figure 5. As with Alternative 4, this alternative would achieve the remedial action objective by eliminating the exposure pathway as well as recognize the Department's preference to restore a site to pre-release conditions where feasible. It should be understood that even with the more aggressive removal of PCBs, the site-wide cover would be still be required due to the presence of historic fill, which contains contaminants at levels which do not allow for unrestricted direct contact.

The components of this remedy are the same as those described above for Alternative No. 4, except soil containing greater than 1 ppm PCB would be removed in addition to the TCLP lead, which would result in a greater volume of soil being removed prior too placement of the site-wide cover. Similarly, the estimated costs for this alternative were developed as for Alternative 4 but reflect a greater quantity of soil removal and disposal.

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

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

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

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

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

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

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

7. Cost-Effectivness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Section 7.1, above. This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs

significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Localized Soil Excavation and Site-Wide Cover as the remedy for this site. The elements of this remedy are described at the end of this section.

The proposed remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.

Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It would achieve the remediation goals for the site by removing the soils that create the most significant threat to public health and the environment, and by preventing uncontrolled exposures to remaining contamination through the installation of a protective cover and the implementation of a site management plan.

Alternative 1 (No Action) would not achieve the threshold criteria. Because Alternative 2 (site-wide soil excavation), Alternative 3 (cover), Alternative 4 (localized soil excavation and site-wide cover), and Alternative 5 (localized soil excavation including PCBs to Part 375-6 commercial criteria plus site-wide cover) would each satisfy the threshold criteria, the five balancing criteria are particularly important in determining a final remedy for the site.

Alternatives 3, 4 and 5 all have similar long-term effectiveness, as all rely on institutional controls, however they do vary in degree with respect to reduction of toxicity, mobility or volume of contaminants. Alternative 2 would remove more contaminants and is more permanent, as it does not rely on institutional controls. Alternative 3 would remove no contaminated soil; Alternative 4 would remove localized areas of contamination totaling approximately 23 cubic yards; and Alternative 5 would remove approximately 1400 cubic yards of soil. As noted in Section 7, it should be understood that even with the additional soil removal obtained under Alternative 5, no additional protection is achieved (when compared to Alternative 4) due to the presence of historic fill throughout the site, and the site-wide cover would be still be required. Covers are reliable and effective engineering controls used to prevent direct contact with residual contamination.

Each alternative (other than No Action) would have short-term impacts such as truck traffic and dust associated with construction and soil removal. However, with Alternative 2, those impacts would be much greater because of the truck traffic and dust associated with a huge volume of soil being removed. The volume of soil removed under Alternative 5 would be significantly larger than Alternative 4, and the short-term impacts would therefore similarly increase.

The time needed to achieve the remediation goals would be longest for Alternative 2 and similar for Alternatives 3, 4, and 5.

Alternatives 2, 3, 4 and 5 are all technically implementable utilizing standard engineering techniques, however, Alternative 2 would be less feasible from an administrative perspective in that it would require more permit determinations and would require a longer shut down period of the main access point to the industrial park.

The cost of Alternative 2 greatly exceeds the cost of the other alternatives. The cost of Alternative 5 is greater than Alternative 4, which in turn is only marginally greater than the cost of Alternative 3 (approximately 1 %).

The estimated present worth cost to implement the remedy is $ 2,279,000. The cost to construct the remedy is estimated to be $1,240,000 and the estimated average annual costs for 30 years is $ 53,000.

The elements of the proposed remedy are as follows:

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

2. Excavation of soils containing PCBs greater than 10 ppm and soils which fail TCLP analysis for lead (>5 mg/l in extract). Area and depth of excavation would be as indicated in Figure 4. Excavated soils would be stockpiled on site and analyzed for appropriate disposal.

3. A soil cover would be constructed over all vegetated areas to prevent exposure to contaminated soils. The one-foot thick cover would consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil would be of sufficient quality to support vegetation. Clean soil would constitute soil that meets the Division of Environmental Remediation's criteria for backfill, as per 6 NYCRR Part 375-6.7. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete at least 6 inches thick.

4. Imposition of an institutional control in the form of an environmental easement that would require (a) limiting the use and development of the property to commercial use, which would also permit industrial use; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

5. Development of a site management plan which would include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation below the soil cover's demarcation layer, pavement, or buildings. Excavated soil would be tested, properly handled to protect the health and safety of workers and the nearby community, and would be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion into any buildings developed on the site, including the mitigation of any impacts identified; (c) identification of any use restrictions on the site; and (d) provisions for the continued proper operation and maintenance of the components of the remedy.

6. The property owner would provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal would: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that would impair the ability of the control to protect public health or the

environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program would be instituted. The key components of the program include the periodic inspection of the cover system, the necessary inspections to support periodic certification of the site use restrictions, and the periodic monitoring of any future sub-slab depressurization systems. This program would allow the effectiveness of the remedy to be monitored and would be a component of the long-term management for the site.

TABLE 1-a
Former Drum Storage Area A
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	.043J – 1.1	1	1 of 8	5.60	0 of 8
	Chrysene	.048J of 1.1	1	1 of 8	56	0 of 8
	Benzo(b)fluoranthene	.037J – 1.5	1	1 of 8	5.60	0 of 8

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic Compounds	Arsenic	1.5B - 17.9	13	1 of 8	16	1 of 8
	Chromium	11.8 - 31.6	30	1 of 8	1500	0 of 8
	Copper	29.9 - 135	50	5 of 8	270	0 of 8
	Lead	38 - 1100	63	15 of 20	1000	1 of 20
	Mercury	0.24 - 0.69	0.18	3 of 8	2.8	0 of 8
	Selenium	0.88J - 4.6J	3.9	1 of 8	1500	0 of 8
	Zinc	65.9 - 519	109	5 of 8	10000	0 of 8

1) Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Unrestricted Use (Table 375-6.8(a))

2)Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Restricted Commercial Use (Table 375-6.8(b))

TABLE 1-b
Former Drum Storage Area B
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Semivolatile Organic Compounds (SVOCs)	Phenol	.054J – 2.93	.330	1 of 37	500	0 of 32
	Naphthalene	.358J – 28.3	1.2	1 of 37	500	0 of 32
	Pentachlorophenol	2.50 – 2.50	.80	1 of 37	6.70	0 of 32
	Anthracene	.064 J – 7.44	100	1 of 36	500	0 of 32
	Benzo(a)anthracene	.039 J – 8.26	1	8 of 36	5.60	1 of 32
	Chrysene	.037 J – 6.99	1	12 of 36	56	0 of 32
	Benzo(b)fluoranthene	.040 – 7.73	1	15 of 36	5.60	1 of 32
	Benzo(k)fluoranthene	.110J – 2.67J	.80	6 of 37	56	0 of 32
	Benzo(a)pyrene	.037J – 5.78	1	8 of 36	1	8 of 32
	Indeno(1,2,3-cd)pyrene	.042J – 2.87J	.50	13 of 37	5.60	0 of 32
	Dibenzo(a,h)anthracene	.042J – .880J	.330	5 of 37	.56	3 of 32

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
PCB/Pesticides	Total PCBs	.04 - 27	.10	21 of 23	1.0	8 of 23

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic	Arsenic	0.38J – 44J	13	4 of 109	16	3 of 32

TABLE 1-b
Former Drum Storage Area B
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Compounds	Barium	14J - 590	350	2 of 32	400	2 of 32
	Beryllium	0.086J - 20	7.2	5 of 32	590	0 of 32
	Cadmium	0.091 – 14	2.5	2 of 32	9.3	1 of 32
	Chromium	6.4J - 150	30	16 of 32	1500	0 of 32
	Copper	14 - 1450	50	30 of 32	270	14 of 32
	Lead	8.2 - 5300	63	31 of 32	1000	5 of 32
	Mercury	0.1 - 5.4	0.18	18 of 32	2.8	8 of 32
	Nickel	8.5J - 330	30	20 of 32	310	1 of 32
	Selenium	0.4J - 14	3.9	1 of 32	1500	0 of 32
	Silver	0.23J - 13	2	2 of 32	1500	0 of 32
	Zinc	34 - 7400	109	31 of 32	10000	0 of 32

1) Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Unrestricted Use (Table 375-6.8(a))
2)Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Restricted Commercial Use (Table 375-6.8(b))

TABLE 1-c
Railroad Siding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Volatile Organic Compounds (VOCs)	Acetone	.004 – .190J	.05	2 of 18	500	0 of 18
	Benzene	.001 - .069	.06	1 of 22	44	0 of 22

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG [(3)]
Semivolatile Organic Compounds (SVOCs)	Phenol	.042J – 3.05	.33	2 of 56	500	0 of 56
	Acenaphthene	.044J – 30.8	20	1 of 56	500	0 of 56
	Fluorene	.039J – 31.9	30	1 of 56	500	0 of 56
	Pentachlorophenol	2.38 – 4.98	.80	2 of 56	6.70	0 of 56
	Anthracene	.045J - 157	100	1 of 56	500	0 of 56
	Fluoroanthene	.056J - 162	100	1 of 56	500	0 of 56
	Benzo(a)anthracene	.041J – 20.6	1	11 of 56	5.60	2 of 56
	Chrysene	.037J – 17.2J	1	11 of 56	56	0 of 56
	Benzo(b)fluoranthene	.047J – 11.3	1	13 of 56	5.60	2 of 56
	Benzo(k)fluoranthene	.057J – 4.31J	.80	6 of 56	56	0 of 56
	Benzo(a)pyrene	.041J – 6.69J	1	9 of 56	1	9 of 56
	Indeno(1,2,3-cd)pyrene	.062J – 4.26	.50	9 of 56	5.60	0 of 56
	Dibenzo(a,h)anthracene	.042J – 1.35J	.33	4 of 56	.56	1 of 56

TABLE 1-c
Railroad Siding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
PCB/Pesticides	Dieldrin	.020 – .021	.005	1 of 22	1.4	0 of 22
	4,4' - DDE	.003J – .018	.003	4 of 22	62	0 of 22
	Endrin	.022 – .022	.014	1 of 22	89	0 of 22
	4,4' - DDD	.008J – .046	.003	5 of 22	200	0 of 22
	4,4' - DDT	.015 – .026	.003	4 of 22	47	0 of 22
	Total PCBs	.018 – 2.50	.10	21 of 51	1.0	4 of 51

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic Compounds	Arsenic	1.1J – 170	13	7 of 56	16	7 of 56
	Barium	10J - 510	350	3 of 56	400	2 of 56
	Beryllium	0.11J - 11	7.2	2 of 56	590	0 of 56
	Cadmium	0.051 – 13.6	2.5	5 of 56	9.3	3 of 56
	Chromium	3.7J - 100	30	8 of 56	1500	0 of 56
	Copper	9.7 - 1500	50	32 of 56	270	6 of 56
	Lead	4.4 - 2070	63	36 of 70	1000	4 of 70
	Manganese	29 - 1900	1600	1 of 56	10000	0 of 56
	Mercury	0.1 – 2.8	0.18	20 of 56	2.8	0 of 56
	Nickel	4.3J – 210J	30	11 of 56	310	0 of 56
	Selenium	0.57J - 11	3.9	2 of 56	1500	0 of 56
	Silver	0.23B – 45.9	2	29 of 56	1500	0 of 56
	Zinc	19 - 3800	109	29 of 56	10000	0 of 56

TABLE 1-c
Railroad Siding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

1) Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Unrestricted Use (Table 375-6.8(a))

2)Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Restricted Commercial Use (Table 375-6.8(b))

Table 1-d
Building 419 and Surrounding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Semi-Volatile Organic	Acenaphthene	.045J – .045J	20	0 of 5	500	0 of 5
Compounds (SVOC)	Fluorene	47J – 51J	30	0 of 5	500	0 of 5

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
PCB/Pesticides	Aldrin	.001J – .001J	.005	0 of 5	.68	0 of 5
	Endosulfan I	.001J – .001J	24	0 of 5	200	0 of 5
	Total PCBs	.001J – 210	.10	26 of 43	1	11 of 43

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic Compounds	Arsenic	7.2 - 25.2	13	2 of 5	16	2 of 5
	Cadmium	1.5 - 3.7	2.5	4 of 5	9.3	0 of 5
	Chromium	34.5 - 116	30	5 of 5	1500	0 of 5
	Copper	176 - 837	50	5 of 5	270	4 of 5
	Lead	236 - 4440	63	5 of 5	1000	1 of 5

Table 1-d
Building 419 and Surrounding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic Compounds	Mercury	0.25 - 1.4	0.18	5 of 5	2.8	0 of 5
	Nickel	41.2J - 129	30	5 of 5	310	0 of 5
	Selenium	0.94J - 5.1	3.9	2 of 5	1500	0 of 5
	Silver	0.61B - 3.1	2	2 of 5	1500	0 of 5
	Zinc	410 – 1850J	109	5 of 5	10000	0 of 5

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Volatile Organic	Methylene Chloride	.005J – .077B	.05	4 of 31	500	0 of 31
Compounds (VOCs)	Acetone	.013 – .081	.05	4 of 27	500	0 of 31

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Semivolatile Organic	Phenol	9.26 – 9.26	.33	1 of 44	500	0 of 44
Compounds (SVOCs)	Benzo(a)anthracene	.042J – 16.1	1	17 of 43	5.6	7 of 43
Semivolatile	Chrysene	.15J – 16.8	1	15 of 44	56	0 of 44

Table 1-d
Building 419 and Surrounding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Organic						
Compounds (SVOCs)	Benzo(b)fluoranthene	.052J – 25.3	1	21 of 43	5.60	7 of 43
(continued)	Benzo(k)fluoranthene	.150J – 6.22	.80	12 of 44	5.60	0 of 44
	Benzo(a)pyrene	.042J – 15.6	1	17 of 43	1	17 of 43
	Indeno(1,2,3-cd)pyrene	.091J – 7.88	.50	18 of 44	5.6	3 of 44
	Dibenzo(a,h)anthracene	.074J – 2.51	.33	11 of 44	.56	9 of 44

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
PCB/Pesticides	Dieldrin	.049 - .061	.005	2 of 31	1.40	0 of 31
	4,4' - DDE	.007 – .014	.003	2 of 31	62	0 of 31
	4,4' - DDT	.006 – .050	.003	5 of 31	47	0 of 31
	Total PCBs	.021 - 54	.1	29 of 73	1	13 of 73

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic	Arsenic	1.1J - 56	13	11 of 44	16	7 of 44
Compounds	Barium	11J - 667	350	1 of 44	400	1 of 44
	Cadmium	0.056J - 10	2.5	7 of 44	9.3	1 of 44
	Chromium	4.5J - 130	30	7 of 44	1500	0 of 44

Table 1-d
Building 419 and Surrounding Area
Nature and Extent of Contamination
Range of sampling dates October 1996-December 2005

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b (1)] (ppm)[a]	Frequency of Exceeding Unrestricted SCG	Restricted Commercial SCG[b (2)] (ppm)[a]	Frequency of Exceeding Restricted Commercial SCG
Inorganic	Copper	8.8 - 600	50	29 of 44	270	6 of 44
Compounds	Lead	6.6 - 5200	63	50 of 73	1000	2 of 73
(continued)	Manganese	140 - 790	1600	0 of 44	10000	0 of 44
	Mercury	0.099 - 4.7	0.18	24 of 44	2.8	1 of 44
	Nickel	3.5J - 120	30	9 of 44	310	0 of 44
	Selenium	0.86J - 4.1J	3.9	1 of 44	1500	0 of 44
	Silver	0.22J - 8.6J	2	22 of 44	1500	0 of 44

1) Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Unrestricted Use (Table 375-6.8(a))

2)Criteria taken from NYSDEC Part 375 Soil Clean-up objectives table for Restricted Commercial Use (Table 375-6.8(b))

TABLE 1-e
Nature and Extent of Contamination
{Range of sampling dates; April 1997 to February 2006}

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a(2)]	Frequency of Exceeding SCG[(1)]
Volatile Organic Compounds (VOCs)	Benzene	2.93J – 2.93J	1	1 of 14
	Xylenes(total)	10U - 41.36	5	2 of 14

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a(2)]	Frequency of Exceeding SCG[(1)]
Semivolatile Organic Compounds (SVOCs)	2,4-Dimethylphenol	2.76J – 2.76J	1	1 of 14

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a(2)]	Frequency of Exceeding SCG[(1)]
Inorganic Compounds	Antimony	3J – 14.9J	3	5 of 14
	Arsenic	10J - 165	25	1 of 14
	Cadmium	0.3J - 7.6	5	1 of 14
	Chromium	1J - 109	50	1 of 14
	Copper	2.9J - 467	200	1 of 14
	Iron	1890 - 48200	300	14 of 14
	Lead	2J - 689	25	4 of 14
	Iron and Manganese	2660 - 48949	500	14 of 14
	Manganese	260 - 5200	300	13 of 14
	Mercury	0.17J - 2.4	0.7	1 of 14
	Potassium	11000 - 328000	NC	NC
	Selenium	12J – 26J	10	3 of 14
	Sodium	98200 - 5370000	20000	14 of 14

TABLE 1-e
Nature and Extent of Contamination
{Range of sampling dates; April 1997 to February 2006}

Notes:

ND A standard defined by the symbol "ND" means not detectable by the analytical tests specified or approved pursuant to Part 700 of the NYSDEC Regulations

(1) For samples where an analyte was detected below the method detection limit and the concentration is estimated (J qualified) and the level is above the SCG, an exceedance was counted. Otherwise, U qualified data (i.e., ND) not counted as an exceedance.

(2) Criteria from Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations for GA classification

Where a compound does not have a numerical standard in Part 703, 50 ug/l was used as the SCG per 10 NYCRR Part 5 of the Sanitary Code.

TABLE 1-f
Nature and Extent of Contamination
Range of sampling dates October 2000-December 2005

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppb) [a]	SCG[b] (ppb) [a] (2)(3)	Frequency of Exceeding SCG (4)
Semivolatile Organic Compounds (SVOCs)	Naphthalene	67 – 280	ER-L – 160 (76)	2 of 14
	2-Methylnaphthalene	72 - 270	ER-L – 70 (69)	11 of 14
	Acenaphthylene	69 - 510	ER-L – 44 (680)	14 of 14
	Acenaphthene	37J – 280J	ER-L – 16 (67)	11 of 14
	Fluorene	34J - 190	ER-L – 19 (73)	12 of 14
	Phenanthrene	220 - 2990	ER-L – 240 (1660)	13 of 14
	Phenanthrene	220 - 2990	ER-M – 1500 (1660)	3 of 14
	Anthracene	75 - 390	ER-L - 85.3 (680)	13 of 14
	Fluoroanthene	320 - 3330	ER-L – 600 (2480)	13 of 14
	Pyrene	300 - 2310	ER-L – 665 (2720)	10 of 14
	Benzo(a)anthracene	290 - 1280	ER-L – 261 (1870)	14 of 14
	Chrysene	210 - 1060	ER-L – 384 (1120)	11 of 14
	Benzo(a)pyrene	91 - 830	ER-L – 430 (170)	8 of 14
	Dibenzo(a,h)anthracene	37J – 280J	ER-L - 63.4 (32)	8 of 14
	Dibenzo(a,h)anthracene	37J – 280J	ER-M – 260 (32)	1 of 14

TABLE 1-f
Nature and Extent of Contamination
Range of sampling dates October 2000-December 2005

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppb) [a]	SCG[b] (ppb) [a] (2)(3)	Frequency of Exceeding SCG (4)
PCB/Pesticides	4,4' - DDE	8.74 - 18.4	ER-L - 2.2 (0.34)	7 of 14
	4,4' - DDD	3.05 - 28.5	10	1 of 14
	4,4' - DDT	0.29 – 5.15	ER-L - 1.58	2 of 14
	Total PCB Congeners	113 - 376	ER-L - 22.7 (38.5)	13 of 14
	Total PCB Congeners	113 - 376	ER-M – 180 (38.5)	4 of 14

TABLE 1-f
Nature and Extent of Contamination
Range of sampling dates October 2000-December 2005

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm) [a]	SCG[b] (ppm) [a (1)(3)]	Frequency of Exceeding SCG [(4)]
Inorganic Compounds	Aluminum	6100J – 6600J	ER-L – NC	NC
			ER-M – NC	NC
	Antimony	1.3J - 1.6J	ER-L – NC	NC
			ER-M – NC	NC
	Arsenic	2.3J - 12.4	ER-L - 8.2 (8.73)	6 of 14
			ER-M - 70	0 of 14
	Barium	42J – 50J	ER-L – NC	NC
			ER-M – NC	NC
	Beryllium	0.087J - 0.51J	ER-L – NC	NC
			ER-M – NC	NC
	Cadmium	0.71- 4.7	ER-L - 1.2 (2.52)	11 of 14
			ER-M - 9.6 (2.52)	0 of 14
	Calcium	7600 – 24000	ER-L – NC	NC
			ER-M – NC	NC
	Chromium	30.7 – 125	ER-L – 81	2 of 14
			ER-M – 370	0 of 14
	Cobalt	6.7 - 7.1	ER-L – NC	NC

TABLE 1-f
Nature and Extent of Contamination
Range of sampling dates October 2000-December 2005

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm) [a]	SCG[b] (ppm) [a (1)(3)]	Frequency of Exceeding SCG [(4)]
Inorganic Compounds (Continued)				
	Copper	84 – 193	ER-L – 34 (79.2)	14 of 14
			ER-M – 270 (79.2)	0 of 14
	Iron	17000 – 19000	ER-L – NC	NC
			ER-M – NC	NC
	Lead	78.4 – 301	ER-L - 46.7 (88.3)	14 of 14
			ER-M – 218 (88.3)	2 of 14
	Magnesium	6300 – 7200	ER-L – NC	NC
			ER-M – NC	NC
	Manganese	180 – 200	ER-L – NC	NC
			ER-M – NC	NC
	Mercury	0.43J - 2.75	ER-L – 0.15 (1.34)	14 of 14
			ER-M - 0.71 (1.34)	11 of 14
	Nickel	16.8 - 27.7	ER-L - 20.9 (20.9)	10 of 14
			ER-M - 51.6 (20.9)	0 of 14
	Potassium	1800 – 2000	ER-L – NC	NC
			ER-M – NC	NC

TABLE 1-f
Nature and Extent of Contamination
Range of sampling dates October 2000-December 2005

SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm) [a]	SCG[b] (ppm) [a (1)(3)]	Frequency of Exceeding SCG [(4)]
Inorganic Compounds (Continued)	Selenium	2.8J - 3.2J	ER-L – NC	NC
			ER-M – NC	NC
	Silver	0.1 - 2.5	ER-L – 1 (0.82)	6 of 14
			ER-M - 3.7 (0.82)	0 of 14
	Sodium	10000 – 14000	ER-L – NC	NC
			ER-M – NC	NC
	Thallium	11 – 13J	ER-L – NC	NC
			ER-M – NC	NC
	Vanadium	21 – 26	ER-L – NC	NC
			ER-M – NC	NC
	Zinc	146 – 464	ER-L – 150 (150)	13 of 14
			ER-M – 410 (150)	2 of 14
	Cyanide	1.5 - 1.5	ER-L - NC	NC
			ER-M – NC	NC

Notes:
(1) SCG taken from NYSDEC document titled, "Technical Guidance for Contaminated Sediments" - For marine sediments. Appendix 4, Table 3 used for inorganics
(2) SCG taken from NYSDEC document titled, "Technical Guidance for Contaminated Sediments" for saltwater samples. Appendix 4, Table 4 values used when applicable. If a constituent was not in Table 4, then per guidance, values from Table 1 were used. The lowest criteria value from Human Health Bioaccumulation (HHB), Benthic Aquatic Life Chronic Toxicity (BALCT), or Wildlife Bioaccumulation (WB) was used as the SCG for comparison when Table 1

TABLE 1-f
Nature and Extent of Contamination
Range of sampling dates October 2000-December 2005

was used.

(3) Background level shown in SCG column in parentheses for reference. Background data taken from the sample labeled "PB REF SURF COMP"

(4) For samples where an analyte was detected below the method detection limit at an estimated concentration (J qualified) that was above the criteria value, an exceedance was counted. Otherwise, U qualified data (i.e., ND) not counted as an exceedance.

ER-L = Effect Range Low and ER-M = effect range - Moderate.

NC = No Criteria

TABLE 1-g
Nature and Extent of Contamination
Sampling Dates December 22 – 23, 2005

SOIL VAPOR	Contaminants of Concern	Concentration Range Detected (µg/m^3) [a]	SCG [b] [(2)] (µg/m^3) [a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Bromodichloromethane	10 - 137	14	1 of 10
	1,3-Butadiene	1.4 - 6.2	0.9	6 of 10
	Chloroform	2.6 - 27	11	1 of 10
	1,1,2,2- Tetrachloroethane	6.1 - 12	4.2	2 of 10
	Tetrachloroethylene(PCE)	16 - 144	<100 [(1)]	2 of 10
	Trichloroethylene (TCE)	3.3 - 18	<5 [(1)]	1 of 10

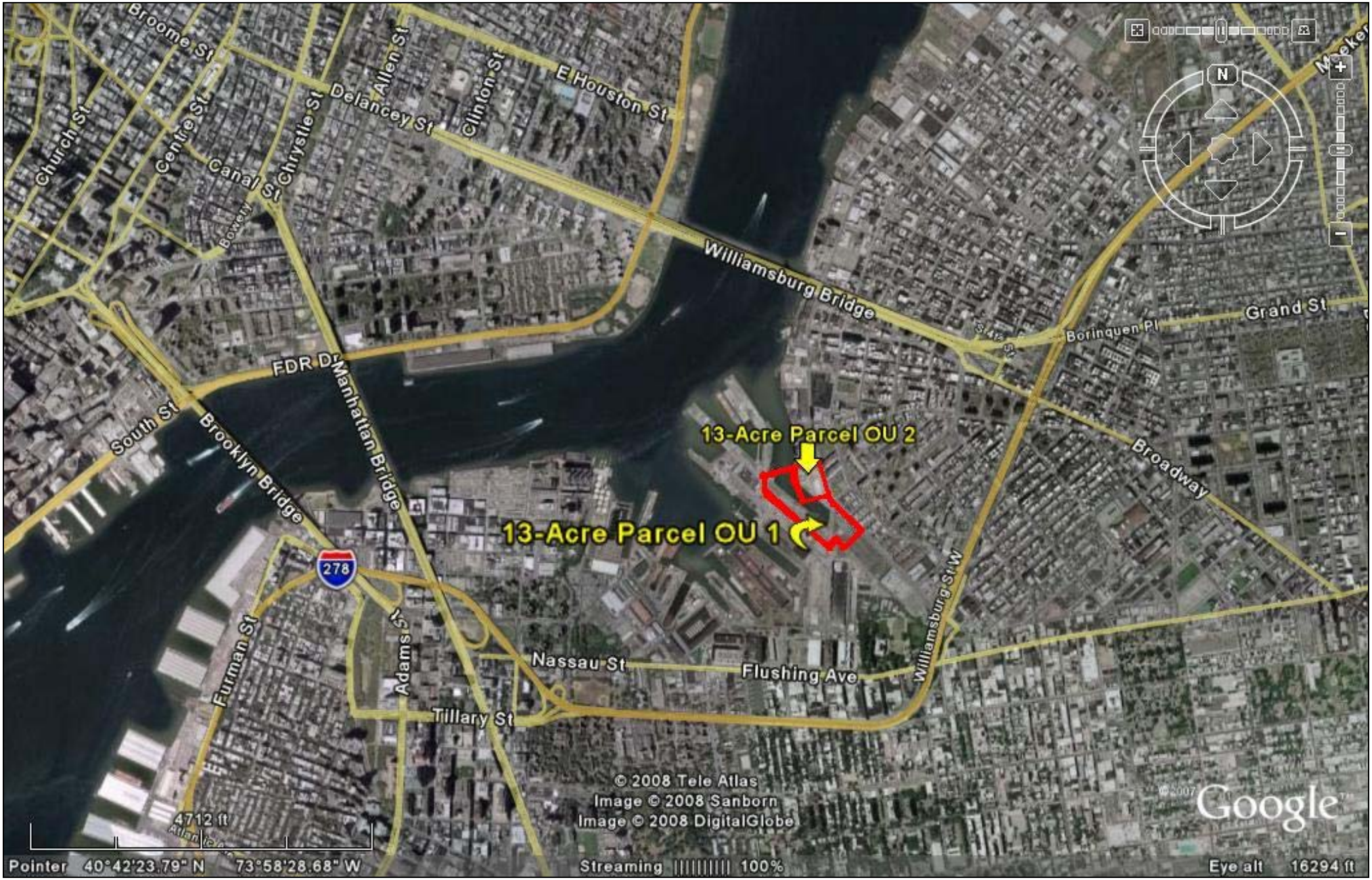
Notes:

(1) SCG taken from Matrix 1 or Matrix 2 from "Guidance for Evaluating Soil Vapor Intrusion in the State of New York". Indoor air concentration assumed to be <0.25 ug/m3 and level indicates the threshold between No Further Action or Monitor/Mitigate.
(2) SCG taken from EPA Shallow Soil Vapor Target Value, 0.1 Attenuation Factor, $1x10^{-5}$ Risk unless otherwise noted. These values were assigned since NYSDOH values were not available (per guidance in the document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York").

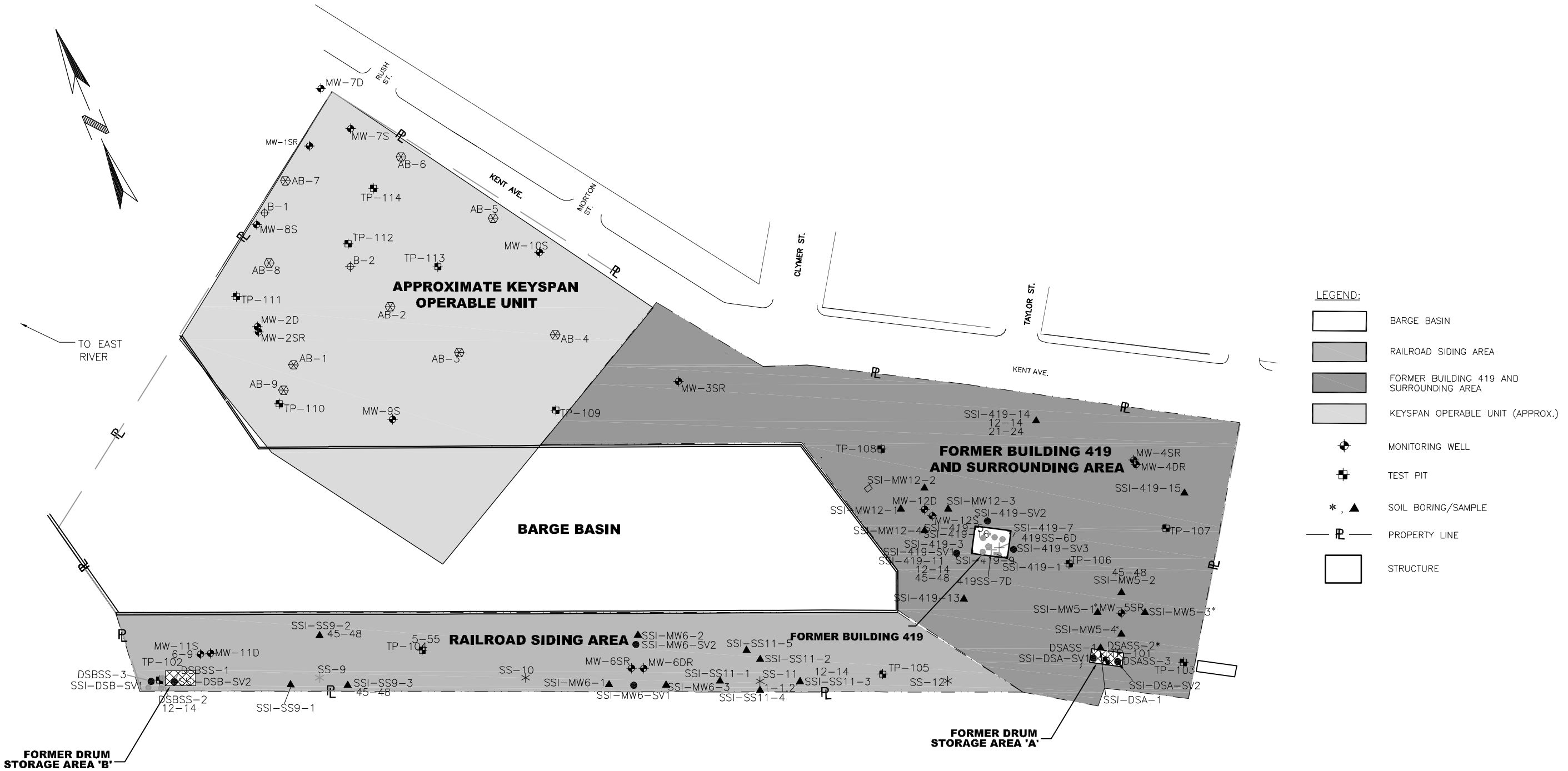
[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter

[b] SCG = standards, criteria, and guidance values;

[c] ER-L = EffectRange - Low and ER-M = Effect Range - Moderate. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the ER-L is exceeded, the impact is considered to be moderate.



Brooklyn Navy Yard 13-Acre Parcel	Figure 1	
Kent Avenue, Brooklyn, Kings County, New York	Site Location	



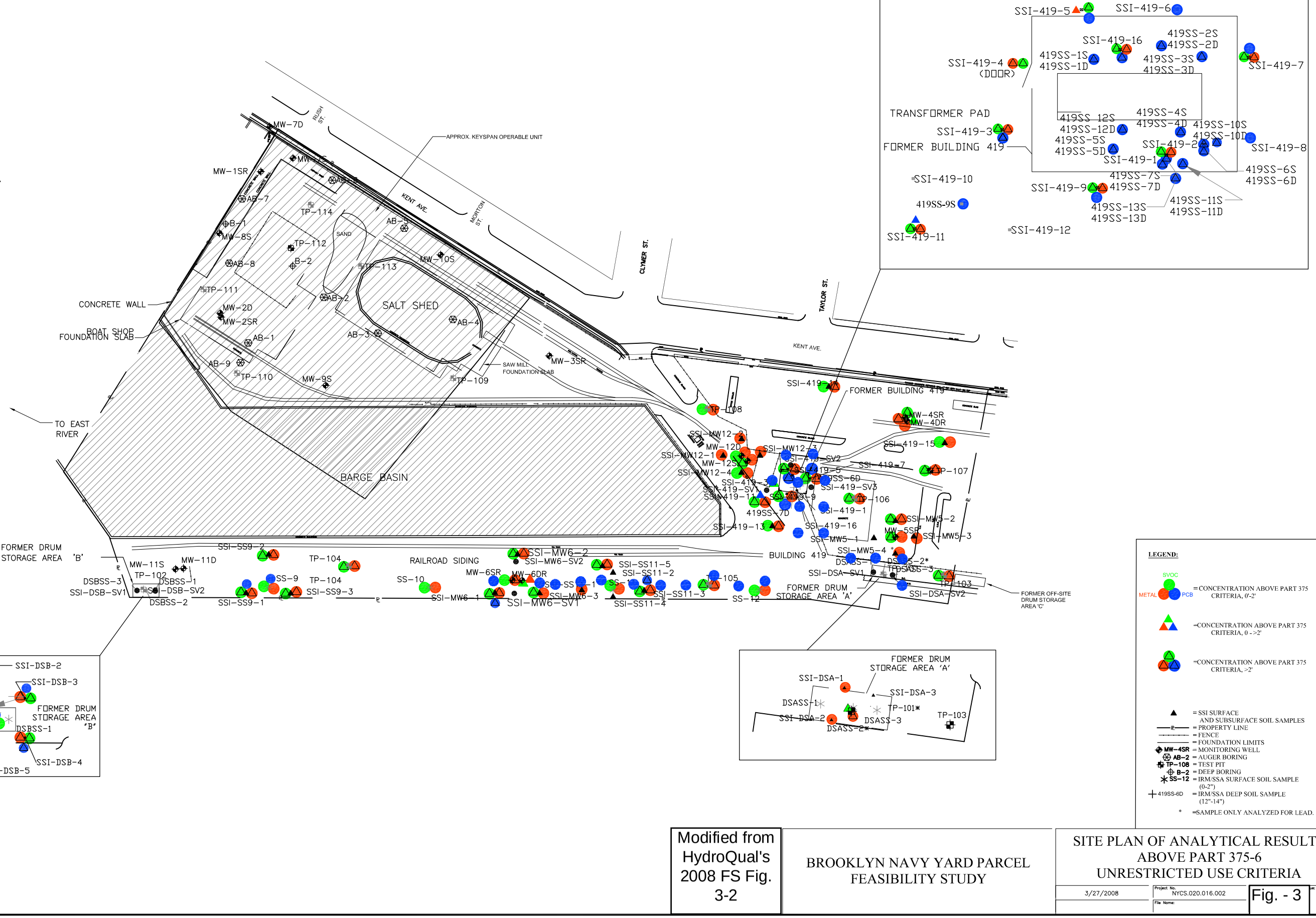
SOURCE:

DRAWING MODIFIED FROM HYDROQUAL'S JUNE 2008
FINAL FEASIBILITY STUDY REPORT

BROOKLYN NAVY YARD PARCEL
FEASIBILITY STUDY

FIGURE -2

AREAS OF INVESTIGATION



Modified from HydroQual's 2008 FS Fig. 3-2

BROOKLYN NAVY YARD PARCEL
FEASIBILITY STUDY

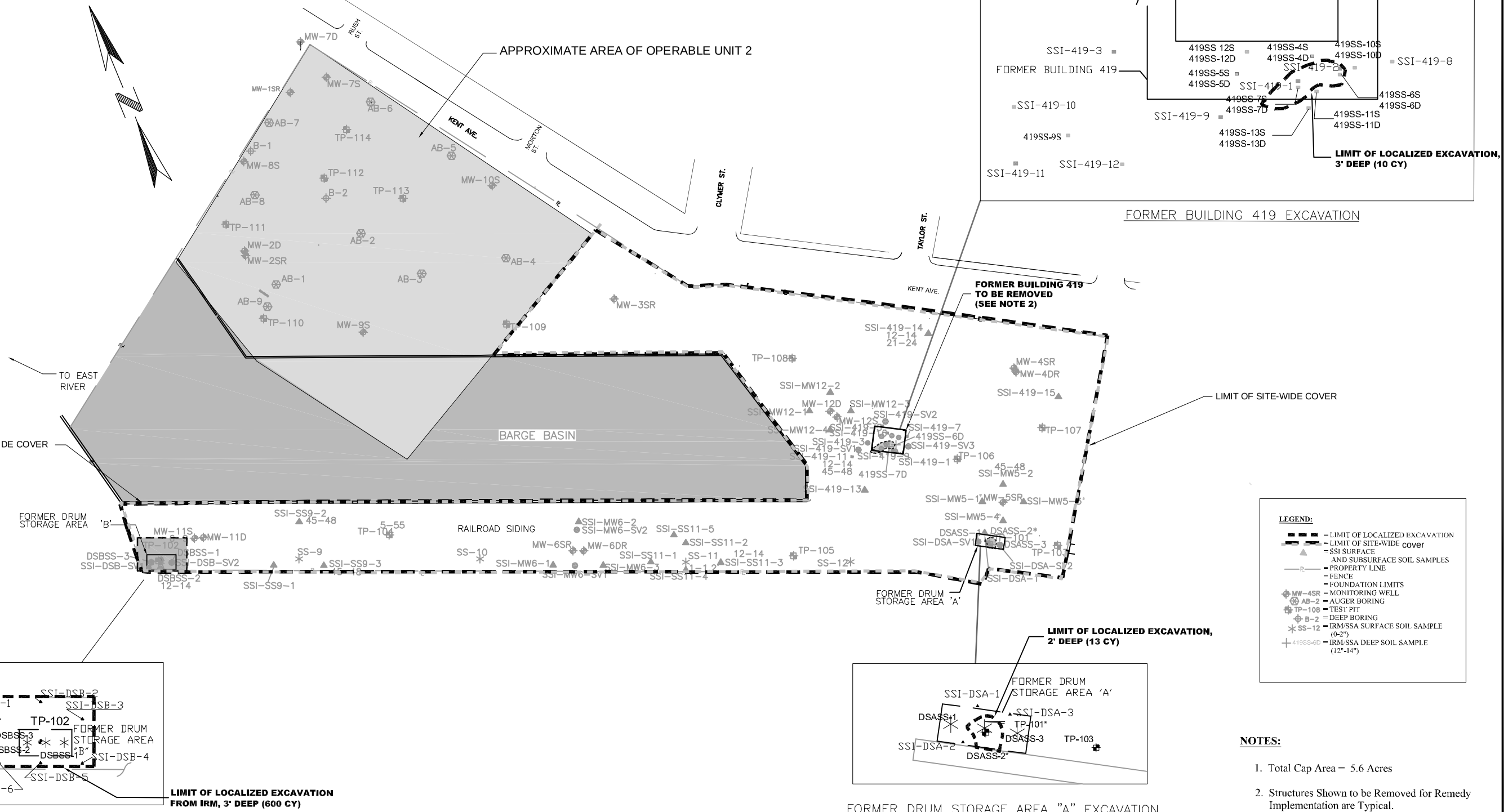
SITE PLAN OF ANALYTICAL RESULTS ABOVE PART 375-6 UNRESTRICTED USE CRITERIA

3/27/2008

Project No. NYCS.020.016.002

File Name:

Fig. - 3



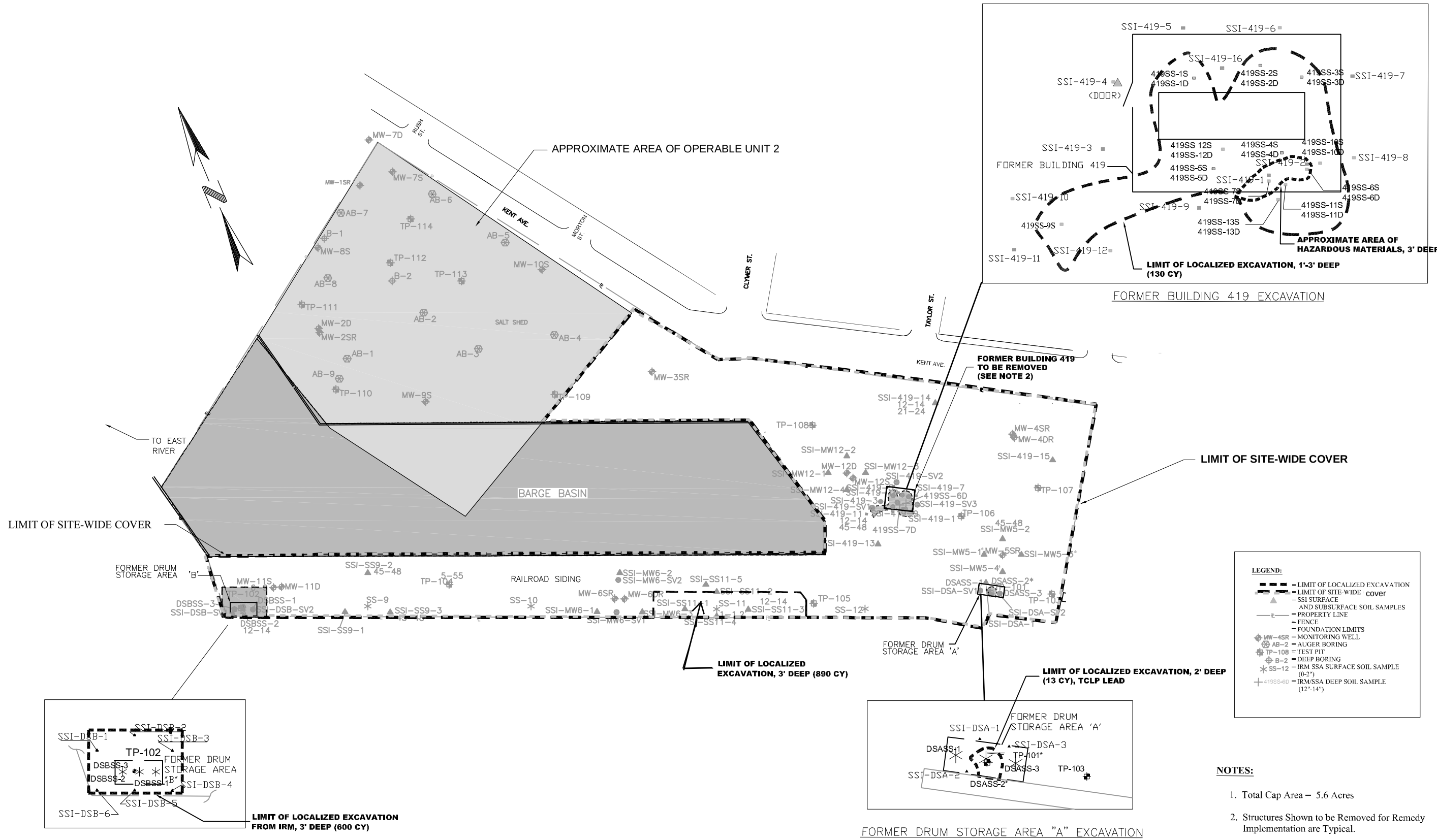
NOTES:

1. Total Cap Area = 5.6 Acres
2. Structures Shown to be Removed for Remedy Implementation are Typical.

BROOKLYN NAVY YARD PARCEL

Alternative 4 Excavation and Site-Wide Cover Site Plan

Figure 4


APPROXIMATE AREA OF OPERABLE UNIT 2
RUSH ST.
KENT AVE.
MORTON ST.
CLYMER ST.
TAYLOR ST.
KENT AVE.
MW-7D
MW-1SR
MW-7S
AB-6
AB-7
TP-114
AB-5
B-1
MW-8S
TP-112
B-2
TP-113
MW-10S
AB-8
TP-111
AB-2
SALT SHED
MW-2D
MW-2SR
AB-4
AB-1
AB-3
AB-9
TP-110
MW-9S
TP-109
MW-3SR
TP-108
SSI-419-14
12-14
21-24
MW-4SR
MW-4DR
SSI-419-15
TP-107
TO EAST RIVER
BARGE BASIN
LIMIT OF SITE-WIDE COVER
FORMER BUILDING 419
TO BE REMOVED
(SEE NOTE 2)
LIMIT OF SITE-WIDE COVER
SSI-MW12-2
MW-12D
SSI-MW12-3
SSI-MW12-1
SSI-419-SV2
MW-12S
SSI-MW12-4
SSI-419-7
419SS-6D
SSI-419-SV3
SSI-419-3
SSI-419-SV1
SSI-419-1
TP-106
SSI-419-11
12-14
45-48
419SS-7D
45-48
SSI-MW5-2
SSI-419-13
SSI-MW5-1
MW-5SR
SSI-MW5-3
SSI-MW5-4
DSASS-1
DSASS-2*
SSI-DSA-SV1
DSASS-3
TP-101*
SSI-DSA-2
SSI-DSA-1
FORMER DRUM STORAGE AREA 'A'
FORMER DRUM STORAGE AREA 'B'
MW-11S
MW-11D
TP-102
DSBSS-3
SSI-DSB-SV1
DSBSS-1
DSB-SV2
DSBSS-2
12-14
SSI-SS9-2
45-48
TP-104
5-55
SS-9
SSI-SS9-3
SS-10
SSI-SS9-1
RAILROAD SIDING
SSI-MW6-2
SSI-MW6-SV2
SSI-SS11-5
MW-6SR
MW-6D
SSI-SS11-2
SSI-SS11-1
SS-11
12-14
TP-105
SS-12
SSI-MW6-1
SSI-MW6-SV1
SSI-SS11-3
SSI-SS11-4
LIMIT OF LOCALIZED EXCAVATION, 3' DEEP (890 CY)
SSI-DSA-SV2
SSI-DSA-1
TP-103
SSI-419-5
SSI-419-6
SSI-419-16
SSI-419-4
(DOOR)
419SS-1S
419SS-1D
419SS-2S
419SS-2D
419SS-3S
419SS-3D
SSI-419-7
SSI-419-3
FORMER BUILDING 419
419SS 12S
419SS-12D
419SS-4S
419SS-4D
419SS-10S
419SS-10D
SSI-419-8
419SS-5S
419SS-5D
SSI-419-2
SSI-419-1
419SS-6S
419SS-6D
SSI-419-10
419SS 7S
419SS-7D
SSI-419-9
419SS-11S
419SS-11D
419SS-9S
419SS-13S
419SS-13D
APPROXIMATE AREA OF HAZARDOUS MATERIALS, 3' DEEP
SSI-419-11
SSI-419-12
LIMIT OF LOCALIZED EXCAVATION, 1'-3' DEEP (130 CY)
FORMER BUILDING 419 EXCAVATION
SSI-DSB-2
SSI-DSB-1
SSI-DSB-3
TP-102
FORMER DRUM STORAGE AREA 'B'
DSBSS-3
DSBSS-2
DSBSS-1
SSI-DSB-4
SSI-DSB-5
SSI-DSB-6
LIMIT OF LOCALIZED EXCAVATION FROM IRM, 3' DEEP (600 CY)
FORMER DRUM STORAGE AREA "B" EXCAVATION
SSI-DSA-1
FORMER DRUM STORAGE AREA 'A'
SSI-DSA-3
DSASS-1
TP-101*
DSASS-3
TP-103
SSI-DSA-2
DSASS-2*
LIMIT OF LOCALIZED EXCAVATION, 2' DEEP (13 CY), TCLP LEAD
FORMER DRUM STORAGE AREA "A" EXCAVATION
LEGEND:
= LIMIT OF LOCALIZED EXCAVATION
= LIMIT OF SITE-WIDE cover
= SSI SURFACE AND SUBSURFACE SOIL SAMPLES
= PROPERTY LINE
= FENCE
= FOUNDATION LIMITS
MW-4SR = MONITORING WELL
AB-2 = AUGER BORING
TP-108 = TEST PIT
B-2 = DEEP BORING
SS-12 = IRM SSA SURFACE SOIL SAMPLE (0-2")
419SS-6D = IRM/SSA DEEP SOIL SAMPLE (12"-14")
NOTES:
1. Total Cap Area = 5.6 Acres
2. Structures Shown to be Removed for Remedy Implementation are Typical.
0
75
150
SCALE IN FEET
BROOKLYN NAVY YARD PARCEL
ALTERNATIVE 5
LOCALIZED SOIL EXCAVATION, PCB's TO 375-6 COMMERCIAL CRITERA, AND SITE -WIDE COVER
Figure 5