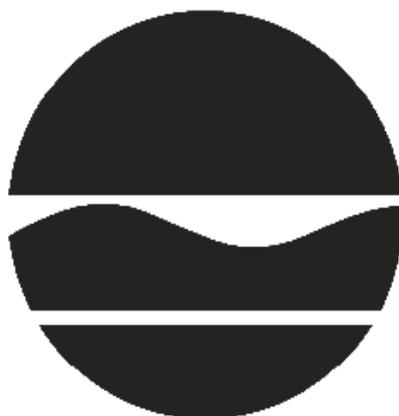


DECISION DOCUMENT

Former Paragon Oil Terminal
Petroleum Remediation Project
Greenpoint, Brooklyn, Kings County
Site No. S224083

Apollo Street Creek Parcels
Petroleum Remediation Project
Greenpoint, Brooklyn, Kings County
Site No. S224122

June 2014



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

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SECTION 1: SUMMARY AND PURPOSE OF THE SELECTED PLAN

The New York State Department of Environmental Conservation (Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced sites. The disposal of contaminants at the sites has resulted in threats to public health and the environment that will be addressed by the remedy selected in this Decision Document (DD). The disposal or release of petroleum at the sites, as more fully described in Section 6 of this document, has contaminated various environmental media.

The Petroleum Remediation Project (PRP) program administers the investigation and remediation of petroleum contamination pursuant to Article 12 of the Navigation Law and/or the Petroleum Bulk Storage Program as defined by ECL, Article 17, Title 10. Sites are included in the Petroleum Remediation Program when the Director of the Environmental Remediation Division determines that the nature and extent of contamination, or the magnitude of the impacts to the environment, are beyond that of a typical spill or emergency response, and the site is specifically designated for a more structured, long-term approach using appropriate regulations and Department guidance.

The Department has issued this document in accordance with the requirements of New York State Navigation Law, Environmental Conservation Law, Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375, and DER-10 Technical Guidance For Site Investigation and Remediation. This document is based on the information that can be found in the site-related reports and documents in the document repositories identified below.

DECLARATION:

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

Michael J Cruden

Digitally signed by Michael J Cruden
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email=mjcruden@gw.dec.state.ny.us, c=US
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Date

Michael Cruden, P.E. - Director, Remedial Bureau E

SECTION 2: CITIZEN PARTICIPATION

The public is encouraged to review the reports and documents, which are available at the following repositories:

Brooklyn Public Library
Grand Army Plaza, Brooklyn
(718) 230-2762

Greenpoint Public Library
107 Norman Avenue, Brooklyn
(718) 349-8504

Brooklyn Community Board No. 1
435 Graham Avenue, Brooklyn

Newtown Creek Monitoring Committee
329 Greenpoint Avenue, Brooklyn
(718) 349-0150

NYSDEC Central Office
Attn: Mr. Benjamin Rung
625 Broadway, 12th Floor
Albany, NY 12233-7017
Phone: (518) 402-9814

In addition, the Department's website www.nysdecgreenpoint.com contains relevant information on these sites including many site reports.

A public comment period was held from February 27, 2014 through March 30, 2014.

A public meeting was held on the evening of March 12, 2014 at the Warsaw at the Polish National Home, 261 Driggs Avenue, Brooklyn, NY. Comments received following the public presentation and during the comment period have been compiled with responses in the Responsiveness Summary included in this document.

SECTION 3: SITE DESCRIPTION AND HISTORY

The Greenpoint section of Brooklyn along Newtown Creek (Greenpoint) has been an area of significant oil refining dating back to the 1830s when whale oil was refined for use as illuminating oil. By the 1860s, petroleum became the primary product refined in Greenpoint. By the late 1800s, it is reported that over 50 petroleum refineries were located along the banks of Newtown Creek. Greenpoint remained a hub of petroleum refining and distribution activity throughout the twentieth century. Various petroleum storage and terminal facilities remain active in Greenpoint today; however, the former Paragon facility ceased operations in 1968 when the site was sold to Peerless Equities, LLC which is currently operated as a liquor distributor.

The two sites included in this Decision Document are adjacent and share a property boundary along the western former Paragon site and eastern Apollo Street site property boundaries.

Former Paragon Oil Terminal (S224083)

Location: The former Paragon Oil Company occupied the property addressed 16, 42, and 50 Bridgewater Street which comprise the current site. These properties are located north of Bridgewater Street and are adjacent to Newtown Creek to the north, Meeker Avenue to the east, and the Apollo Street site to the west.

Site Features: Paragon operated a terminal storing fuel oil (numbers 2, 4, and 6), lube oil, gasoline, diesel fuel, and kerosene at this location until sometime before 1969 when Peerless Importers built a warehouse on the property. In 2004, the site owner replaced over 400 feet of the concrete bulkhead with a steel bulkhead to add structural support to the fill and parking lot on the north side of the property. A grout wall was added in 2006. In 2008, Texaco applied a sealant to the seams of the existing steel bulkhead in the area of product recovery to further prevent product seepage into the creek. In addition to the bulkhead upgrades, Texaco also maintains five “globe-” boom containment cells. The globe-boom was formerly located inside a secondary “fence-” boom along the Newtown Creek bulkhead. These five globe-booms contain any product that may escape from landside.

The current Texaco product recovery system includes 13 total-fluid recovery wells located along the bulkhead on the 50 Bridgewater Street portion of the property. The total-fluid pumps bring both product and water from the subsurface to an oil-water separator, where the product is stored in an above ground storage tank (AST), while groundwater is pumped through a treatment system and discharged to the combined sanitary sewer system via a NYCDEP discharge permit. The collected oil product is removed offsite for oil recovery and reuse on a periodic basis.

Presently the former Paragon property is occupied by the Peerless/Empire Merchant’s warehouses, offices, and parking lot for their truck fleet.

Current Zoning and Land Use: The Former Paragon Oil Terminal site is in the M3-1 zoning manufacturing district, zoned for industrial and commercial use. Land use in the vicinity of the subject site is mixed industrial, commercial, and residential.

Past Use of the Site: Beginning in 1886, two companies operated on this property; the Locust Hill Refining Company and Greenpoint Oil Refining. Both of these companies ended operation by 1905. From 1905 to 1921, a portion of the property operated as a cement works company. By 1929, a portion of the property was being operated as a petroleum storage terminal by Supreme Oil, which later became known as the Petroleum Terminal Corporation. The other portion of the property was privately owned until 1928 when it became the Brooklyn Ash Removal Company. By 1934, operations throughout the property were generally either run by or affiliated with the Paragon Oil Company, which operated the site as a petroleum storage terminal. Paragon Oil was purchased by Texaco Oil, now known as the Chevron/Texaco Corporation, in 1958. The property was sold to Peerless Equities in 1968, and Empire Merchants now operates the property as a liquor distribution warehouse. According to a 2005 consent agreement with the NYSDEC, Texaco is responsible to delineate and remediate the portion of the free product plume underlying the Former Paragon Oil Terminal and control seepage of petroleum into Newtown Creek at this location.

Operable Units: This site has been divided into four (4) operable units (OUs). OU 01 pertains to product recovery and seep control. Operable units 02, 03, and 04 pertain to other remedial measures related to groundwater, soil, and vapor, respectively.

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

Site Geology and Hydrogeology: Soil borings and monitoring well logs completed during the various investigations for the Phase Separated Hydrocarbon (PSH) plume delineation and subsequent investigations indicate that fill, consisting of sand, silt, gravel, cinders, and wood, generally exists to a depth of 15 to 20 feet below the ground surface. The majority of the material below the fill was documented as sand or silty-clayey sand. Isolated areas of native (non-fill) silt and clay were documented, but the review of the available information suggests these deposits are minimal and are localized.

Groundwater investigations indicate that groundwater in the shallow water-bearing zone, at the Paragon and Apollo Street sites, exists under unconfined conditions. On the north side of the sites near Newtown Creek, the water table is in the fill material. Deeper groundwater, found in the regional alluvial sand and gravel, is found under semi-confined conditions beneath the silt. Groundwater at the sites is saline and influenced by tidal conditions in Newtown Creek. Depth to groundwater in the shallow water-bearing zone generally ranges from approximately five to twenty-four feet.

From approximately 1900 through 1947, groundwater flow was reversed from the natural flow direction toward the Newtown Creek and flowed south to southeast, away from Newtown Creek and toward the area of industrial pumping. Groundwater flow at the sites has since returned to pre-pumping conditions towards the Newtown Creek and the former Paragon property in a north and westward direction.

Apollo Street Creek Parcels (S224122)

Location: The Apollo Street Creek Parcels are New York City tax parcels located at 100 and 120 Apollo Street and currently occupied as part of the Empire Merchants liquor warehouse and offices. These properties are located north of Bridgewater Street and are adjacent to Newtown Creek and the BP Terminal (S224082) to the north, and the Former Paragon Oil Terminal (S224083).

Apollo Street Creek Parcels are defined as the land area enclosed by the southern boundary of the BP-Amoco Terminal property, the boundary of the Peerless Importers property, the boundary of Bridgewater Street, and Newtown Creek, and Steel Equities located at 100-120 Apollo Street, and that portion of Apollo Street running from Bridgewater Street to Newtown Creek.

Site Features: Other than the end of the Apollo Street, the parcels consist of three connected buildings, small areas of pavement, and a small area of vegetation along Newtown Creek. The Apollo Street site is owned by Apollo Steel, LLC and Peerless Equities, LLC and leased to

Empire Merchants for warehouse operations. The Apollo Street site is approximately 3 acres in size with approximately 2.6 acres covered by warehouse.

The current Texaco product recovery system at the adjacent Former Paragon Terminal includes 13 total-fluid recovery wells located along the bulkhead at 42 and 50 Bridgewater Street and 120 Apollo Street. One of the recovery wells is located on the Apollo Street Creek Parcels. The total-fluid pumps bring both product and water from the subsurface to an oil-water separator, where the product is stored in an above ground storage tank (AST), while groundwater is pumped through a treatment system and discharged to the combined sanitary sewer system via a NYCDEP dewatering permit. The collected product is removed offsite and properly disposed of on a monthly basis.

Current Zoning and Land Use: The properties are in an M3-1 zoning manufacturing district, zoned for industrial and commercial use. Land use in the vicinity of the subject site is mixed industrial, commercial, and residential. Residential areas are approximately one block to the southwest.

Past Use of the Site: These parcels have been bordered by numerous past petroleum operations including both refining and distribution, however, based on available documentation, have never included petroleum operations on the property. Significant fill was added to the area in the late 1800's to fill tidal wetlands and create land. Brooklyn Ash Disposal likely operated at the site for a significant period in the 1900s. More recent uses of the site include stone cutting and distribution operations, and other distribution warehouses. The Apollo Street site has no known history of petroleum refining or distribution operations.

Operable Units: Similar to the Former Paragon Oil Terminal Site above, this site has been divided into 5 operable units (OUs). OU 01 pertains to product recovery and seep control. Operable units 02, 03, and 04 pertain to other remedial measures related to groundwater, soil, and vapor respectively. OU 00 pertains to site management activities.

Site Geology and Hydrogeology: The Apollo Street Creek Parcels site and the Former Paragon Oil Terminal sites are adjacent and have similar geology and hydrogeology. See the description on page 6 above for details.

A site location map and site figure map are attached as Figure 1 and 2 respectively. Figure 3 provides an aerial photograph of site conditions in 1929 and indicates approximate site boundaries. The sites have been defined to include only land-based area; Newtown Creek is not considered part of these sites.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department considers the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives that restrict the use of the site to industrial / commercial use, as described in Part 375-1.8(g), were evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and

guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the site investigation reports.

SECTION 5: ENFORCEMENT STATUS

Texaco, Inc. signed an Order on Consent Case #D2-1111-01-05 finalized September 20, 2005 that included a work plan and schedule for investigation and actions to address petroleum seepage at the Former Paragon Oil Terminal. The Order on Consent was amended on May 15, 2009 to include the adjacent Apollo Street Creek Parcels and require a comprehensive remedial plan for both sites.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

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

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

The analytical data collected on these sites includes data for:

- groundwater
- soil
- soil vapor
- indoor air

As indicated in Section 3, Newtown Creek is not considered part of these sites, therefore surface water and sediment data were not collected as part of the site investigations.

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

6.1.2: RI Results

The analytical data collected on these sites includes data for:

- groundwater
- surface water
- soil
- sub-slab/soil vapor

The data have identified contaminants of concern. A "contaminant of concern" is a contaminant that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Section 6.3 below. Additionally, Site Characterization and Remedial Investigation Reports contain a full discussion of the data. In addition to the PSH source material, the main contaminants of concern identified at both sites include:

- petroleum
- Benzene
- Toluene
- Ethylbenzene
- Xylene
- n-Propylbenzene
- Trimethylbenzene(s)
- Isopropylbenzene

The contaminants of concern exceed the applicable SCGs for:

- soil
- groundwater

6.2: Interim Remedial Measures

An Interim Remedial Measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be expeditiously addressed before issuance of the Decision Document.

The following IRMs have been completed at the subject sites based on conditions observed during the site investigation and monitoring:

IRM Creek Recovery Boom and Secondary Fence Boom

Starting in 1991, petroleum seepage was noted entering Newtown Creek along the bulkhead at the Former Paragon Oil Terminal site. To control and allow for collection of seepage, a 500-foot long containment boom was placed in Newtown Creek. From approximately 1991 through July 2007, recovery of petroleum captured behind the boom was achieved via skimming operations

from boats on the Creek until adsorbent booms were deemed sufficient. Between 1991 and 2005, approximately 32,000 gallons of petroleum were recovered. Since 2005, due to reduction in seepage, the collection has been completed primarily through the use absorbent material and is negligible.

IRM Grout Wall at Former Paragon Oil Terminal Bulkhead

The grout wall IRM activities at the Former Paragon Oil Terminal site included a pilot and full scale installation of a grout wall to impede seepage of petroleum product to Newtown Creek. The pilot phase included approximately 120 feet of grout wall installed in October and November 2004 behind Section 4 of the Peerless Importers bulkhead in the area of the greatest historical seepage to Newtown Creek.

Based on the reduction in seepage from the pilot phase, Texaco designed and implemented a full scale application across the length of seepage at the Former Paragon Oil Terminal site. The full scale grout wall was constructed from September 2006 through November 2006 and extends approximately 440 linear feet and spans across sections of the lower and upper bulkhead. The grout wall extends 10 feet beyond the eastern end of the creek side boom containment system, while on the west end the wall extends to within approximately 20 feet of the former Paragon site property line. Due to obstructions near the property line and the conversion to a concrete gravity wall bulkhead and timber cribbing bulkhead at the property line and onto the Apollo Street Creek Parcels site, it was not feasible to extend the wall further and an “L-shaped” end was constructed to further contain possible petroleum migration and seepage. Unlike the pilot phase, the full scale wall was installed directly behind the steel bulkhead into pea gravel backfill along the wall. Due to the need to avoid additional loading and pressure on the bulkhead, the grout wall is not anchored into an impermeable layer, but instead designed to impede the flow of petroleum while allowing groundwater several feet below the floating petroleum to remain in communication with Newtown Creek.

IRM Total Fluids Recovery and Treatment System and Upgrades

The Total Fluid Recovery and Treatment System (TFR) was intended to abate the on-going phase separated hydrocarbon (PSH) seepage into Newtown Creek. Since startup of the TFR system in September 2007, the system has recovered approximately 33,000 gallons of PSH, and has treated and discharged approximately 45,000,000 gallons of groundwater.

The TFR system extracts both groundwater and PSH from the subsurface via thirteen recovery wells. The recovered liquids are transferred to an on-site treatment system where the PSH is separated from the groundwater and transported off-site for recycling. The dissolved-phased contaminants are then treated for removal from the groundwater, and the treated effluent water is discharged under permit to the NYCDEP combined sewer. Currently, two recovery locations are on the Apollo Street Creek Parcels site and eleven recovery wells are located on the Former Paragon Oil Terminal site.

IRM Bulkhead Sealing and Epoxy Coating, and Curtain Wall

While the grout wall and TFR system greatly reduced seepage of PSH to Newtown Creek, periodic seepage continued to be noted particularly in isolated locations along the steel bulkhead and in sections of the concrete and timber bulkhead sections. As a result, addition IRM activities

were conducted to control or prevent seepage in these locations. From February to September 2007, work was conducted on the steel bulkhead to seal any remaining seams to reduce seepage. Periodic maintenance on the seams has continued if seepage is noted. In addition, from September 2008 through December 2008, extensive repairs were conducted to the surface of the concrete gravity wall above timber cribbing that serves as the bulkhead along the southern portion of the Apollo Street Creek Parcels site. Concrete cracks on the wall were filled with hydraulic cement or grout, and forms utilized to repair spalled sections of the wall. Once the concrete wall was repaired, an impermeable liner was installed to act as a barrier to prevent open spaces below the wall from acting as short circuits and allowing seepage of petroleum to the creek

IRM Manual Phase Separated Hydrocarbon (PSH) Removal

The Manual PSH IRM activities have utilized vacuum extraction at site monitoring and recovery wells to periodically extract fluids in the wells from June 2005 through July 2007 and utilized monitoring wells located along the Former Paragon Oil Terminal site bulkhead and in the site parking garage in the vicinity of the seepage entering Newtown Creek. During this period, approximately 12,000 gallons of petroleum were removed for offsite disposal. With the imminent operation of the TFR system discussed in this section, the majority of wells were converted into active recovery wells and the manual removal was suspended. Beginning in July 2011, Texaco re-initiated the vacuum recovery in monitoring wells near the bulkhead that contained petroleum accumulation, as well as initiating pilot recovery operations at select wells in other areas of the property. Since the implementation of the vacuum recovery in 2011, the monitoring wells have generally shown a reduction in petroleum thickness, and the manual recovery efforts are continuing at this time.

IRM Indoor Air Monitoring, Warehouse Slab Sealing and Inspection Program

Based on subsurface investigation work and soil gas sampling below building slabs at the Former Paragon Oil Terminal site that indicated elevated levels of petroleum related compounds in vapor, several IRM activities were taken to prevent vapor intrusion and monitor indoor air. Currently a routine inspection and maintenance program is in place to inspect site building slabs for cracking or other damage and make appropriate repairs including sealing or filling of cracks. The inspection utilizes visual inspection and metering to investigate potential vapor pathways. In addition, biannual air monitoring has been occurring since 2006 to verify that measures to mitigate vapor intrusion are effective. Offices located at the rear of the 50 Bridgewater Street parcel have had a sub-slab depressurization system (SSDS) voluntarily installed. Offices at 16 Bridgewater Street are located near soil vapor extraction (SVE) points. If actions are required to address soil vapor intrusion, operation of the SVE system will be required.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Former Paragon Oil Terminal (S224083) & Apollo Street Creek Parcels (S224122)

Summary of Phase Separated Hydrocarbon Contamination:

Documentation of Phase Separated Hydrocarbons (PSH), observed seeping from behind a bulkhead into Newtown Creek, began in 1991. Data collected from monitoring well gauging events completed across the Former Paragon Oil Terminal and Apollo Street Creek Parcels has been used to estimate the extent of PSH on the water table at these sites and is presented in Figure 4. The lateral extent of PSH on both sites has been fairly consistent since the delineation and mapping of the PSH was expanded in June 2005. The subsurface PSH is considered the primary source of ongoing impacts to the groundwater and the subsurface soil vapor. Migration of PSH into the surface waters of Newtown Creek is currently controlled by interim remedial measures discussed in Section 6.2 including the TFR collection system and grout wall. PSH thicknesses within the area of influence of the TFR system have been decreasing since 2006.

Summary of Soil Contamination:

During historic development of the sites, material was imported and deposited to fill the former creek channel, creating land for industrial uses. Site boring logs document this fill as consisting of ash, bricks, wood, sand, fine-grained soil, and other fill material. The majority of the unsaturated soil beneath the site is historic fill material with the ash and debris likely from the former Brooklyn Ash Removal Company occupancy of the Apollo Street sites. Compiled data demonstrates that polycyclic aromatic hydrocarbon (PAH) presence is predominantly resulting from historic fill at the sites.

A combination of past refining and petroleum distribution activities, the composition of the historic fill material, and the migration of the PSH plume at the sites have resulted in contamination of site soils. The Paragon site and Apollo Street site are completely developed, with a series of interconnected warehouses, driveways, and paved parking lots at grade. Currently, all impacted soil underlies either concrete warehouse floors or asphalt areas outside the warehouses and within the fenced property line. The contaminated soil at the sites is capped and contained at their present location.

The foreseeable use of this site is considered to be industrial or commercial. While a total of 39 sample locations contained at least one exceedance of the unrestricted use standards for the gasoline contaminated soil compound list, only five locations contained at least one exceedance of the commercial use standards and only three locations contained at least one exceedance of industrial use standards. For fuel oil contaminated soil compound list, the unrestricted use standard was exceeded at 34 sample locations with both the commercial and industrial use SCOs exceeded at 24 locations. However, as indicated above, data indicates the PAH component of the fuel oil parameter list was likely historically deposited on the site with the fill to create useable land by raising the original grade across the Paragon and the Apollo Street sites. The presence of PAHs in the soil appears to predate the petroleum impacts to the site or be related to other development activities.

In addition to the limited soil contamination above restricted industrial use objectives, investigation data indicates the majority of impacts to soil are around the saturated zone at the sites. IRM activities are recovering PSH in this zone and the continued presence of the PSH on

the water table is contributing to soil contamination. The PSH impacts to soils will be mitigated by the ongoing further PSH recovery.

Summary of Groundwater Contamination:

Groundwater at these sites is also impacted by petroleum contamination; however, groundwater recovery via the TFR system maintains a capture zone of impacted groundwater and PSH at both low and high tides to prevent this migration into the creek. The tidally influenced capture zone results in a water flow from the creek into the recovery system at the site. While groundwater impacts are present above the NYSDEC standards for groundwater, the exceedances are primarily associated with the proximity of the PSH plume.

Summary of Sub-slab Vapor/Indoor Air Contamination:

Sub-slab and soil vapor is impacted by petroleum contamination at these sites. Elevated levels of contaminants have been detected in air collected from sub-slab and soil vapor points, however based on the compounds included in the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York from October 2006 decision matrices, no action to mitigate has been required. Levels in the indoor air are generally consistent with background levels and with the levels expected given the current uses of the buildings. Interim remedial measures to monitor indoor air concentrations, and maintenance and metering measures on the building slab will be continued while remedial measures address the source of vapor contamination.

A list of significant investigation reports with additional details on the environmental assessment are provided in Exhibit 1.

6.4: Summary of Human Exposure Pathways

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

Direct contact with contaminants in the soil is unlikely because the majority of the site is covered with buildings and pavement. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a source not affected by this contamination. Volatile organic compounds in the groundwater may move into the air spaces within the soil (soil vapor), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. A sub-slab depressurization system was installed in a portion of the building to prevent vapors beneath the slab from entering the building in those areas. Air monitoring is recommended and there is a commitment to continue air monitoring in remaining portions of the building.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375 and DER-10 Technical Guidance for Site Investigation and

Remediation. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the sites through the proper application of scientific and engineering principles.

The remedial action objectives (RAOs) for this site are attached in Table 1. The Table lists the RAOs and also illustrates the remedial actions that are being proposed to achieve each of the objectives.

SECTION 7: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and evaluation of the remedial criteria are presented in the Technology Screening Report dated August 16, 2013 and the Alternatives Analysis Report dated August 16, 2013 for the Former Paragon Oil Terminal and 100-120 Apollo Street Property. The remedy has been selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The remedy selected is a Restricted use with site-specific soil cleanup objectives.

The elements of the selected remedy for the two sites, are as follows:

Elements of the Remedy:

1. Extraction and treatment system of approximately 17 to 20 recovery wells located along the bulkhead to create cones of drawdown that capture the groundwater and phase separated hydrocarbon (PSH) flow, preventing them from discharging into Newtown Creek. The system includes the existing IRM system and an expansion of 4 to 6 recovery wells.
2. Continued performance of operation and maintenance activities that include:
 - Periodic indoor and outdoor ambient air monitoring, sub-slab vapor monitoring, and groundwater monitoring.
 - Periodic inspection and sealing of significant cracks and seams in the warehouse floors to maintain a competent barrier to the vapor intrusion pathway.
 - Maintenance and inspection of the project area bulkheads, steel bulkhead seam sealing, and Apollo Street containment barrier maintenance to assist the TFR system maintain hydraulic control further mitigating PSH migration into Newtown Creek.
3. Continued operation of the existing treatment system, or approved modification thereof, (currently granular activated carbon (GAC) system) for treating extracted groundwater. Use of GAC in current IRMs has been shown to be effective for the treatment of dissolved phase contaminants in recovered groundwater and will remain the intended treatment.
4. Separate-phase recovery (periodic pumping, bailing, vacuum recovery, or other approved methods) of PSH from non-extraction wells and from wells within the warehouse. A

work plan for periodic PSH removal from non-extraction wells and from wells within the warehouse will be prepared to continue removal using approved methods.

5. Continued monitoring and maintenance of containment systems and capping with existing physical barriers (e.g. grout wall, bulkhead improvements, bulkhead seam sealing, barrier membrane, concrete warehouse floors and paved areas covering 99 percent of the site, and boom system maintenance along Newtown Creek).
6. Monitored Natural Attenuation (MNA), consisting of sampling of physical, chemical, and biological indicators, to include the areas inside and outside the extraction and treatment zones, and for residual PSH in the capture zone of the extraction and treatment system,. A design plan shall be prepared to define the program of monitoring and sampling and the Site Management Plan (SMP) will address long-term implementation of the program. Groundwater contamination, residual petroleum contamination, and residual PSH will be addressed by MNA. Groundwater will be monitored for site related contamination and also for MNA indicators that will provide an understanding of the biological activity breaking down the contamination. It is anticipated that petroleum contamination will approach groundwater standards with the removal of the PSH. Reports of the attenuation will be provided with progress reporting and discussed in a 5-year review. Active remediation will be proposed if it appears that natural processes alone will not address the contamination.
7. Multi-Phase Extraction (MPE) through addition of a Vapor-Phase Recovery (VPR) component to the extraction and treatment system to target residual PSH remaining in the unsaturated zone. A VPR component will be added to each recovery well currently in place at the site and any additional installed recovery wells. The VPR will be operated to remove PSH in conjunction with the continued operation of the recovery well and extraction and treatment system.
8. Catalytic oxidation shall be used for vapor-phase gas treatment until VOC concentrations decline to levels where vapor-phase GAC or other approved treatment methods become a more appropriate and cost-effective treatment option.
9. A Site Management Plan (SMP) is required, which includes the following:
 - a. An Institution and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: land use restrictions, monitoring, groundwater use restrictions, notification requirements, and periodic certifications.

Engineering Controls: The continued use of and maintenance of containment system and capping with existing physical barriers (grout wall, bulkhead improvements, bulkhead seam sealing, barrier membrane, building slabs, and paved areas to mitigate vapor intrusion and prevent contact with contaminated soils.

This plan includes, but may not be limited to:

- An Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination, if any;
- Descriptions of the provisions of the institutional controls including any land use and/or groundwater use restrictions;
- A provision for evaluation of the potential for soil vapor intrusion for any future buildings developed on the site, including provisions for implementing actions recommended to address exposures related to soil vapor intrusion;
- Provisions for the management and inspection of the identified engineering controls;
- Maintaining site access controls and Department notification; and
- The steps necessary for the periodic reviews and certifications of the institutional and/or engineering controls.

b. A Monitoring Plan to assess the performance and effectiveness of the remedy.

The plan includes, but may not be limited to:

- Monitoring of groundwater, soil vapor and sub-slab vapor to assess the performance and effectiveness of the remedy;
- A schedule of monitoring and frequency of submittals to the Department;
- Monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above; and
- Continued evaluation of the potential for soil vapor intrusion of existing site buildings, including provisions for implementing actions recommended to address exposures related to soil vapor intrusion.

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

- Compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
- Maintaining site access controls and Department notification; and
- Providing the Department access to the site and O&M records.

10. Establishment of Institutional Controls (ICs) to protect human health and the environment. ICs shall include: (i) use of statutes, regulations, ordinances and zoning restricting the use of the property to industrial or commercial uses; (ii) an agreement with the applicable parties providing for the implementation of the SMP approved by the Department; (iii) a restriction on the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the NYSDOH or County DOH; (iv) elements of a SMP that through engineering controls and/or monitoring will prevent human exposure to vapors and soils that would pose an

unacceptable human health risk; (v) a communication program with the property owners and tenants that will keep them informed of the engineering control activities; and (vi) a requirement that the Remedial Party complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3). ICs are to be implemented via the SMP, with the final site controls determined at a future date as part of potential closure activities. Final ICs will be developed at the time of closure and shall comply with Department requirements in place at the time as applicable to the site.

11. Under provisions of the SMP and DER 10-6.5 Remedial Process Closure Requirements, a comprehensive review of the remedy and site management will be conducted every five years until achievement of site closure conditions.
12. Green remediation principals and techniques will be implemented to the extent feasible in the site management of the remedy as per DER-31. The major green remediation components are as follows:
 - Considering the environmental impacts of treatment technologies and remedy stewardship over the long-term;
 - Reducing direct and indirect greenhouse gas and other emissions;
 - Increasing energy efficiency and minimizing use of non-renewable energy;
 - Conserving and efficiently managing resources and materials;
 - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste.

ATTACHMENTS

Figure 1 – Site Location

Figure 2 – Site Figure

Figure 3 – Historic Aerial Photograph

Figure 4 – Extent of Phase Separated Hydrocarbons (PSH)

Table 1 – Remedial Action to meet Remedial Objectives

Exhibit 1 – Investigation Reports

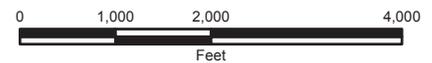
Exhibit 2 – Responsiveness Summary

Exhibit 3 – DOH Concurrence

FIGURE 1
Site Location

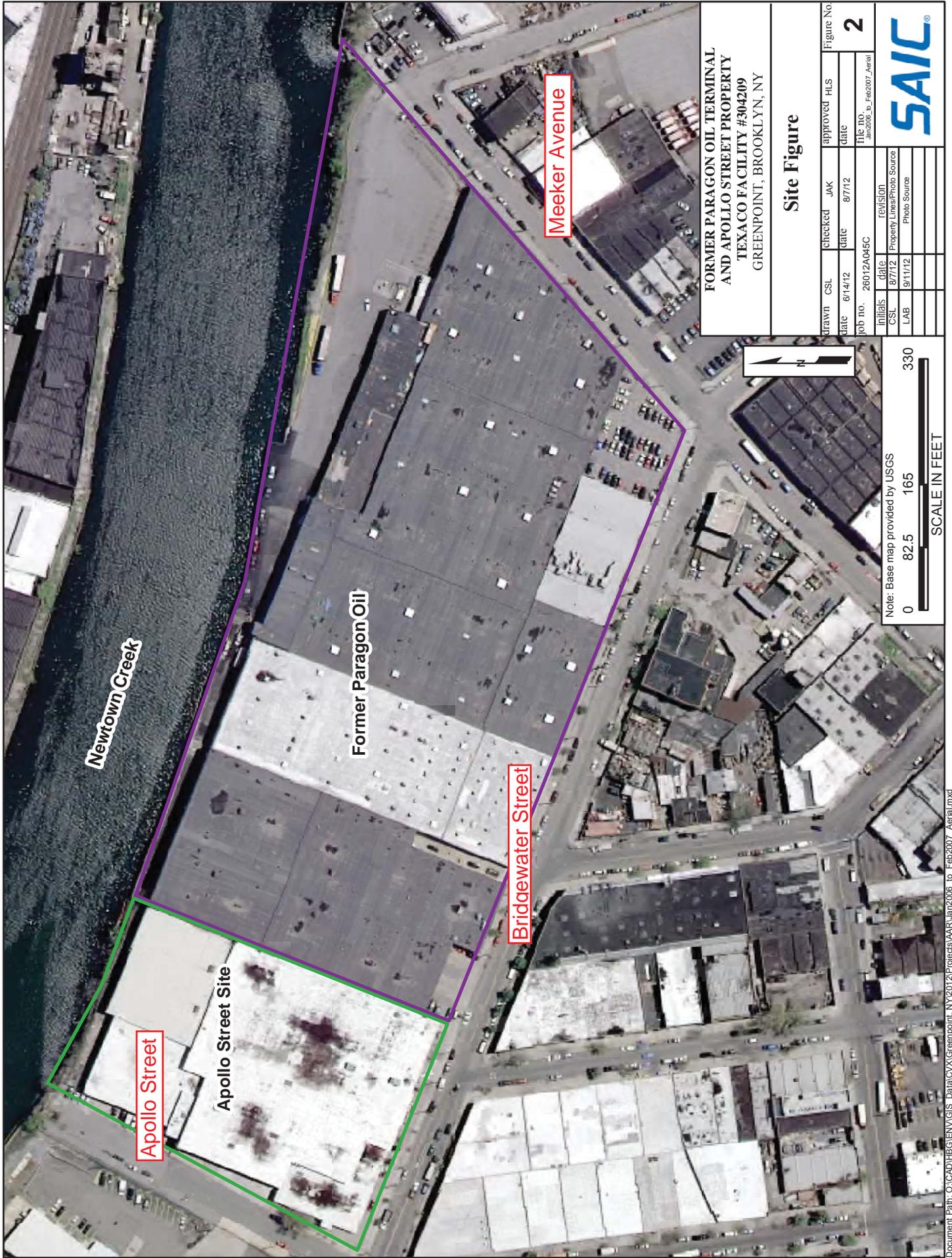


NOTE: Aerial photography was collected in April 2004 by the USGS at 0.5 meter resolution and is natural color.



FORMER PARAGON OIL TERMINAL AND APOLLO STREET PROPERTY TEXACO FACILITY #304209 GREENPOINT, BROOKLYN, NY			
Site Location Map			
drawn AGM	checked JAK	approved HLS	figure no.
date 10/27/2010	date 8/7/2012	date	1
job no. 26011A045A		file no. Site Location 2012-01-06	
initials	date	revision	SAIC
LAB	11/17/11	Update Logo/job #	

FIGURE 2
Site Figure



FORMER PARAGON OIL TERMINAL
 AND APOLLO STREET PROPERTY
 TEXACO FACILITY #304209
 GREENPOINT, BROOKLYN, NY

Site Figure

Drawn	CSL	checked	JAK	approved	HLS	Figure No.
Date	6/14/12	date	8/7/12	date		2
Job No.	26012A045C					
initials	date	revision	File No.			
CSL	8/7/12	Property Lines/Photo Source	Jan2006 to Feb2007 Aerial			
LAB	9/11/12	Photo Source				

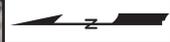
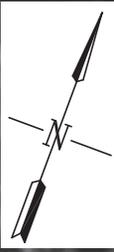


FIGURE 3
Historic Aerial Photograph



APOLLO STREET SITE

FUTURE PARAGON OIL TERMINAL



FORMER PARAGON OIL TERMINAL
AND APOLLO STREET PROPERTY
TEXACO FACILITY # 304209
GREENPOINT, BROOKLYN, NY

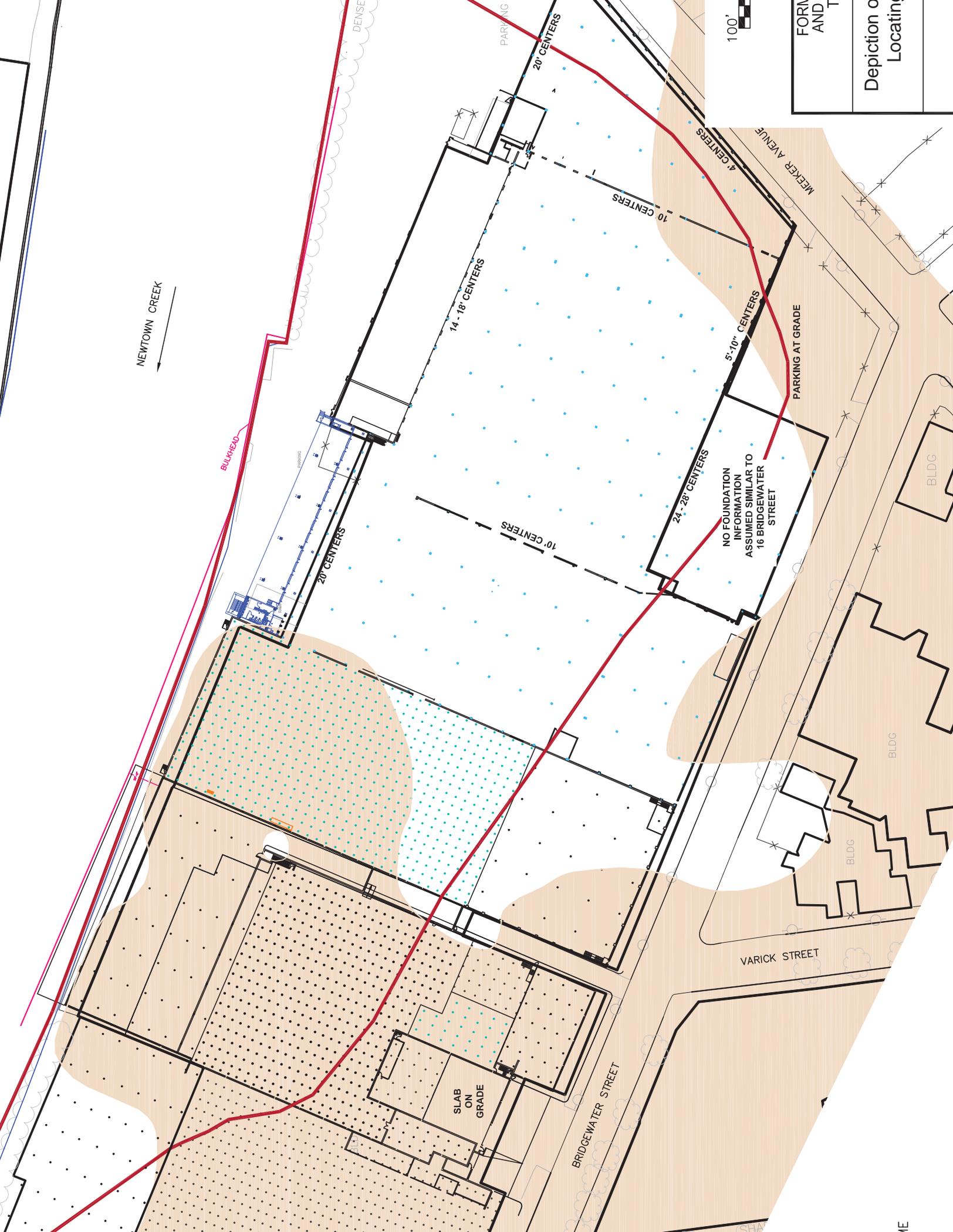
1929 AIR PHOTO
LOOKING SOUTHWEST

job no. 26012A45C-R10-100	
file no. AAR-2-1.dwg	
drawn RAM	date 09/07/12
checked JAK	date 09/19/12
approved	date
file no. AAR-2-1.dwg	
figure no.	3



SOURCE: FAIRCHILD AERIAL SURVEY (UCLA ARCHIVES)

FIGURE 4
Extent of
Phase Separated Hydrocarbons (PSH)



FORM AND T
Depiction of Location

TABLE 1
Remedial Actions
to meet
Remedial Objectives

Table 1

**Summary of Recommended Site Remedy to Meet Remedial Action Objectives
Former Paragon Oil Terminal and Apollo Street Sites**

s224083 / s224122

Greenpoint, Brooklyn, NY

Phase Separated Hydrocarbon (PSH) RAOs for Environmental Protection	
Proposed Remedial Actions	
Remedial Action Objectives (RAOs)	<ul style="list-style-type: none"> Achieved with a combination of the operation of the Total Fluids Recovery(TFR) system and periodic removal of PSH from existing site wells. Measured PSH thicknesses in wells across the site are observed to be declining. Achieved through combination of grout wall, the Apollo Street site containment barrier, and containment boom system previously employed at this site and operation of the TFR system. PSH removal has reduced the thickness of measured PSH at many wells across the site, reducing its future mobility. Achieved by the presence of a cap, in the form of building slabs or pavement which cover the majority of the site, including all impacted areas. Ambient and workplace air monitoring will be addressed in the Site Management Plan (SMP). Achieved, as the site is fully developed with warehouses and parking lots. There is little likelihood that future activities will create an exposure to volatiles from PSH. The SMP will include processes to safely handle vapors encountered during potential future excavation activities. Achieved by the reduction of PSH on the site through operation of engineering controls . PSH recovery has been achieved through a combination of operating theTFR system and periodic bailing or vacuum removal of PSH from existing site wells. Measured PSH thicknesses in wells across the site are observed to be declining. Moving forward, application of PSH removal equipment and the application of additional technologies is expected to support the achievement of this Objective.
Reduce Residual Volume of PSH.	
Prevent Migration of PSH to sensitive receptors (Newtown Creek).	
Prevent contact with, or inhalation of volatile organic compounds from PSH	
Recover PSH, to the practicable amount possible.	
Groundwater RAOs for Public Health Protection	
Proposed Remedial Actions	
RAOs	<ul style="list-style-type: none"> Achieved by the availability and connection to the public water supply system that is provided in this area by the city. The source of the water supply is upstate reservoirs, remote from this site. Water quality in the shallow water-bearing zone is brackish and unusable for potable or industrial use. Achieved, as the site is fully developed with warehouses and parking lots. There is little likelihood that future activities will create an exposure to groundwater. The SMP will include processes to safely handle groundwater duringpotential future excavation activities. Achieved and documented in the SMP by periodically monitoring and assessing evidence for successful elimination of contaminants in treated water discharge from the TFR System. Periodic groundwater monitoring and contingency plans to address residual groundwater contamination will be developed in the SMP. SMP may also include addition of a deed restriction at a future date. Achieved by the presence of a cap, in the form of building slabs or pavement which coverthe majority of the site, including all impacted areas. Ambient and workplace air monitoring will be addressed in the SMP. Achieved, as the site is fully developed with warehouses and parking lots. There is little likelihood that future activities will create an exposure to volatiles from contaminated groundwater. TheSMP will include processes to safely handle vapors encountered duringpotential future excavation activities. Achieved by the reduction of contaminant mass on the site through operation of engineering controls and natural processes .
Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.	
Prevent contact with, or inhalation of volatile organic compounds from contaminated groundwater	

Table 1 is intended to provide a brief summary of remedial actions that are applicable in addressing the site RAOs. The listing is not intended to be comprehensive of all actions or replace the elements of the remedy included in the remedial decision.

Table 1
Summary of Recommended Site Remedy to Meet Remedial Action
Objectives Former Paragon Oil Terminal and Apollo Street Sites
s224083 / s224122
Greenpoint, Brooklyn, NY

Groundwater RAOs for Environmental Protection	
RAOs	Proposed Remedial Actions
Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.	<ul style="list-style-type: none"> Achieved through the development of the remedy which include groundwater and PSH removal, Vapor Phase Recovery (VPR) of PSH, and monitored natural attenuation (MNA). The SMP will outline the operation and monitoring plan details. The selected remedy and the SMP will include groundwater and PSH recovery, VPR, and monitoring to document and provide an endpoint for the engineering controls. All groundwater captured by the TFR system is treated to New York City Department of Environmental Protection permit standards prior to discharge to the sanitary sewer system. Achieved through the use of a groundwater and PSH recovery system, and augmented by VPR and other PSH recovery methods as appropriate as described in the SMP. Achieved and documented in the SMP by periodically monitoring and assessing evidence for successfully eliminating contaminant discharge. The TFR system and grout wall barrier provide containment by maintaining hydraulic control of the groundwater gradient and creating a net flow to the recovery pumps, thereby preventing contaminated groundwater flow into Newtown Creek. Achieved through the development of the remedy which include groundwater and PSH removal, VPR of PSH, and monitored natural attenuation (MNA). The SMP will outline the operation and monitoring plan details. Achieved and demonstrated by periodic monitoring and analysis as described in the SMP.
Prevent the discharge of contaminants to surface water.	
Remove the source of ground or surface water contamination.	
Soil RAOs for Public Health Protection	
RAOs	Proposed Remedial Actions
Prevent ingestion/direct contact with contaminated soil.	<ul style="list-style-type: none"> Achieved, as the site is fully developed with warehouses and parking lots. Buildings and pavement form cap over the site where contamination is present. There is little likelihood that future activities will create an exposure to contaminated soil. The SMP will include procedures to safely handle soil removed and exposures that may be created during potential future excavation activities. Achieved, contamination is at depth at this site. Even if cap removed, no impacted soil is expected to erode. Achieved, the entire site is contained behind bulkheads and not exposed to erosion. Achieved, as the site is fully developed with warehouses and parking lots. Buildings and pavement form cap over the site where contamination is present. There is little likelihood that future activities will create an exposure to contaminated soil. The SMP will include procedures to safely handle soil removed and exposures that may be created during potential future excavation activities. Achieved, contamination is at depth at this site. Even if cap removed, no impacted soil is expected to erode. Achieved, primary constituents of concern in vadose zone are non-volatile polyaromatic hydrocarbons. Achieved through crack and seam sealing of the warehouse floors and ambient air monitoring which will continue until they are determined necessary under an SMP.
Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.	

Table 1 is intended to provide a brief summary of remedial actions that are applicable in addressing the site RAOs. The listing is not intended to be comprehensive of all actions or replace the elements of the remedy included in the remedial decision.

Table 1
Summary of Recommended Site Remedy to Meet Remedial Action
Objectives Former Paragon Oil Terminal and Apollo Street Sites
s224083 / s224122
Greenpoint, Brooklyn, NY

Soil RAOs for Environmental Protection	
Proposed Remedial Actions	
RAOs	<ul style="list-style-type: none"> · Achieved, as the site is paved (capped), except for two riverbank areas that support trees and shrubs on a steep slope over the older bulkhead areas. No soil is exposed to erode. · Achieved, contamination is at depth at this site. Even if cap removed, no impacted soil is expected to erode. · Achieved, the entire site is contained behind bulkheads and not exposed to erosion. · Achieved, The site is paved, except for two riverbank areas that support trees and shrubs on a steep slope over the older bulkhead areas. No soil is exposed to provide an ingestion or direct contact entry into the terrestrial food chain. · Achieved, the site does not provide habitat for terrestrial food chain.
Surface Water RAOs for Public Health Protection	
RAOs	<ul style="list-style-type: none"> · Prevent ingestion of water impacted by contaminants. · Prevent contact or inhalation of contaminants from impacted water bodies. · Prevent surface water contamination which may result in fish advisories.
Proposed Remedial Actions	
	<ul style="list-style-type: none"> · Newtown Creek is a major industrial waterway. Surface water is not being used as a source of drinking water. . · Newtown Creek is a major industrial waterway. As documented in NYDOH Newtown Creek Public Health Assessment Community Fact Sheet-March 2012, NYDOH has issued a health advisory for recreational activities (i.e., swimming, scuba diving, wind surfing (with full body immersion), canoeing, kayaking boat touring, and catch-and-release fishing. · The TFR system and grout wall barrier provide containment by maintaining hydraulic control of the groundwater gradient and creating a net flow to the recovery pumps, thereby preventing contaminated groundwater flow into Newtown Creek · As documented in NYDOH Newtown Creek Public Health Assessment Community Fact Sheet- March 2012, NYDOH Fish Advisory already in effect.
Surface Water RAOs for Environmental Protection	
RAOs	<ul style="list-style-type: none"> · Restore surface water to ambient water quality criteria for the contaminant of concern. · Prevent impacts to biota from ingestion/direct contact with surface water causing toxicity and impacts from bioaccumulation through the marine or aquatic food chain.
Proposed Remedial Actions	
	<ul style="list-style-type: none"> · N/A Newtown Creek is currently listed as National Priority List (NPL) site and this remedial action objective is being handled under United States Environmental Protection Agency Order · N/A Newtown Creek is currently listed as National Priority List (NPL) site and this remedial action objective is being handled under United States Environmental Protection Agency Order
Sediment RAOs for Public Health Protection	
RAOs	<ul style="list-style-type: none"> · Prevent direct contact with contaminated sediments. · Prevent surface water contamination which may result in fish advisories.
Proposed Remedial Actions	
	<ul style="list-style-type: none"> · N/A Newtown Creek is currently listed as National Priority List (NPL) site and this remedial action objective is being handled under United States Environmental Protection Agency Order. · The TFR system and grout wall barrier provide containment by maintaining hydraulic control of the groundwater gradient and creating a net flow to the recovery pumps, thereby preventing contaminated groundwater flow into Newtown Creek.

Table 1 is intended to provide a brief summary of remedial actions that are applicable in addressing the site RAOs. The listing is not intended to be comprehensive of all actions or replace the elements of the remedy included in the remedial decision.

Table 1
Summary of Recommended Site Remedy to Meet Remedial Action
Objectives Former Paragon Oil Terminal and Apollo Street Sites
s224083 / s224122
Greenpoint, Brooklyn, NY

Sediment RAOs for Environmental Protection	
Proposed Remedial Actions	
<p>RAOs</p> <p>Prevent releases of contaminant(s) from sediments that would result in surface water levels in excess of (ambient water quality criteria).</p> <p>Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.</p> <p>Restore sediments to pre-release/background conditions to the extent feasible.</p>	<ul style="list-style-type: none"> · N/A Newtown Creek is currently listed as National Priority List (NPL) site and this remedial action objective is being handled under United States Environmental Protection Order. · N/A Newtown Creek is currently listed as National Priority List (NPL) site and this remedial action objective is being handled under United States Environmental Protection Agency Order · N/A Newtown Creek is currently listed as National Priority List (NPL) site and this remedial action objective is being handled under United States Environmental Protection Agency Order
Soil Vapor RAOs for Public Health Protection	
Proposed Remedial Actions	
<p>RAOs</p> <p>Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.</p>	<ul style="list-style-type: none"> · Achieved with the remediation of PSH, as the soil vapor present on the site is generated from the PSH. Achieved through crack and seam sealing of the warehouse floors and ambient air monitoring which will continue until they are determined not necessary under an SMP.

Table 1 is intended to provide a brief summary of remedial actions that are applicable in addressing the site RAOs. The listing is not intended to be comprehensive of all actions or replace the elements of the remedy included in the remedial decision.

EXHIBIT 1
Investigation Reports

Former Paragon Oil Terminal
Petroleum Remediation Project
Greenpoint, Brooklyn, Kings County
Site No. S224083

Apollo Street Creek Parcels
Petroleum Remediation Project
Greenpoint, Brooklyn, Kings County
Site No. S224122

Investigation reports:

- 1) Initial Site Characterization Report, SAIC, October 2004;
- 2) Peerless Importers Remedial Investigation, Roux Associates, January 2005;
- 3) Site Characterization Report for the Former Paragon Oil Terminal and Adjacent Areas, SAIC, October 2006;
- 4) Supplemental Site Characterization Report for the Former Paragon Oil Terminal and Apollo Street Site, SAIC, February 2007;
- 5) Apollo Street, Remedial Investigation Report, EEEPC, February 2008; and
- 6) Supplemental Site Characterization Report for the Former Paragon Oil Terminal and Apollo Street Site, Benham, November 2010.

EXHIBIT 2
Responsiveness Summary

RESPONSIVENESS SUMMARY

Greenpoint Petroleum Remediation Project

Former Paragon Oil Terminal & Apollo Street Creek Parcels

NYSDEC Public Meeting

Wednesday March 12, 2014 6:00 – 9:00 pm

Warsaw at the Polish National Home

261 Driggs Avenue, Brooklyn NY 11222

An availability session was conducted, beginning at 6:00 pm, followed by a brief presentation and question & answer session, at 7:00 pm, to discuss the remedy proposed for the Former Paragon Oil Terminal site and the Apollo Street Creek Parcels site. Approximately 25 members of the public attended the availability session and presentation.

The following is a summary of the questions asked following the presentation and the New York State Department of Environmental Conservation (DEC) responses:

Question 1: Please describe the difference between Alternative 5 (expanded extraction and treatment with vapor phase recovery) and Alternative 6 (expanded extraction and treatment with vapor phase recovery and large-scale indoor remediation).

Response 1: For the Alternative 6 evaluation the DEC looked at areas covered by the building in order to achieve additional recovery, however, the structure presents a number of obstacles which put limitations on the type of work that can be performed such as drilling and trenching. The building is also actively used and stores flammable material, which causes further restrictions. While Alternative 6 proposes additional recovery to the extent practical, this remedy was less desirable, because of the above constraints and due to both short- and long-term impacts to the warehouse facility.

Question 2: With all the wells outside of the building, will these wells reach a point where they are not drawing product?

Response 2: Yes, oil thickness is thinning and oil recovery has been declining since the implementation of the current recovery system in 2007. The remaining oil is generally located in less accessible areas at the site, but that too is expected to decline over time.

Question 3: Please talk more about natural attenuation.

Response 3: Monitored Natural Attenuation (MNA) is commonly used as part of a site remedy. At this site, a program will be developed to look at naturally occurring microbes and how the breakdown of petroleum contamination is occurring. A design plan will be prepared to define the program of monitoring and sampling and the Site Management Plan (SMP) will address long-term implementation of the program. Groundwater will be monitored for site related contamination and also for MNA indicators that will provide an understanding of the biological activity breaking down the contamination.

Question 4: Clarify the no action versus no further action.

Response 4: No action, as the title suggests, involves taking no action to address the identified contamination. No further action acknowledges the remedial activities that have taken place to address the identified contamination and often includes continued operation of a treatment system and/or site management activities (e.g., operation, maintenance and monitoring).

Question 5: When will the recovery be completed?

Response 5: Evaluation of alternatives, for the sake of consistency, considers a 30-year timeframe. While active recovery is ongoing and a decrease in product thickness has been observed, it is difficult to say with accuracy when recovery will be completed. Texaco has indicated that this remedy will occur over the 30-year timeframe and beyond, as necessary to achieve remedial objectives.

Question 6: Can you talk more about vapor phase recovery (VPR) and any associated impacts on the surrounding community?

Response 6: The VPR will tie into existing product recovery system wells and begin pulling vapors from the soil above the water table at these locations. Some of the vapor will be recovered as petroleum and the remaining vapor will enter a treatment unit on-site that will eliminate the hydrocarbons and meet New York State discharge criteria for air. This treated vapor will have no detrimental impact on the community.

Question 7: What does the VPR capture system look like? Will a community air monitoring plan (CAMP) surround the VPR?

Response 7: Additional tubing or piping is added to wells that allow a vacuum to be created to pull vapor out of the subsurface (via the well) and send it to a treatment system, typically carbon canisters, which remove the contamination from the air stream, or a catalytic oxidation system that destroys the contamination. There will be a start-up phase to ensure that the system can achieve the desired contaminant reduction, and development of a monitoring plan, including ambient air monitoring, to verify that the system is operating properly and meeting the planned reduction levels and discharge criteria.

Question 8: Are there residential properties currently being monitored for indoor air quality?

Response 8: Residential properties are not being monitoring as part of the Former Paragon Oil Terminal & Apollo Street Creek Parcels. However, residential properties were sampled for soil vapor intrusion (vapors under buildings and indoor air) in 2006 as part of the overall Greenpoint Petroleum Remediation Site. Based on the sample results, indoor air concentrations were determined to be within the acceptable limits and no further action was required. There are also permanent soil vapor monitoring points that Exxon Mobil monitors on a semi-annual basis, as well as an off-site VPR system that recovers and treats vapor.

Question 9: What extent are other groups involved in the Greenpoint cleanup (beyond DEC and DOH)? Is there a way that the community and local businesses can be made aware of the various remedial actions?

Response 9: The NYS Attorney General is also involved, working with DEC on all of these sites, while Riverkeeper is involved in various parts of the process. More information about this project and all of the other sites in the area can be found on the DEC Greenpoint web site www.nysdecgreenpoint.com . Also, interested parties can sign up for the DEC listserv at www.dec.ny.gov/chemical/61092.html . As a listserv member, you will periodically receive site-related information/announcements.

Question 10: Are the various cleanup sites administered separately (e.g., under different programs/management)?

Response 10: The three potentially responsible parties (ExxonMobil, BP, and Texaco) are all responsible for cleaning up petroleum on their respective sites under DEC's Spill Program. Tonight's talk is about one site in particular, while we're also mentioning the other remediation projects occurring in Greenpoint (i.e., chlorinated plume). DEC has assigned different project managers so the remediation can occur faster at each of these sites. If someone wants more information about these projects, DEC can provide the contact information for the project managers of respective sites.

Question 11: Is there a requirement to maintain the bulkhead?

Response 11: A Site Management Plan (SMP) is required as part of the remedy. The SMP outlines requirements for monitoring and maintaining any part of a system that is involved with the site remedy, which includes the bulkhead.

Question 12: Is the grout wall permanent? Does it have a life span?

Response 12: The grout wall is intended to be a permanent part of the site remedy through continued maintenance and necessary replacement over time. Annual inspections and maintenance of the grout wall, and replacement if necessary, are part of the Site Management Plan for this site.

Question 13: Can you comment on other regional sites such as dredging of sediment within the Creek?

Response 13: Newtown Creek is a Federal Superfund Site that is listed on the National Priority List (NPL) of hazardous waste sites and is not part of the Former Paragon Oil Terminal & Apollo Street Creek Parcels cleanup. The sediment and any associated dredging will be part of the Newtown Creek site remediation. More information regarding the Newtown Creek Site can be found at <http://www.epa.gov/region2/superfund/npl/newtowncreek>.

Documents may also be found at the following repositories:

Borough of Brooklyn:
Greenpoint Public Library
107 Norman Avenue at Leonard Street
718-349-8504

Borough of Queens:
Long Island City Public Library
37-44 21st Street
718-752-3700

Also, the US Environmental Protection Agency Community Involvement Coordinator may be contacted at (212) 637-3676 or via email at ayala.wanda@epa.gov.

Question 14: Is the NYSDOH involved in each of the projects/sites in the Greenpoint area?

Response 14: The NYSDOH is involved in all of the brownfield and inactive hazardous waste disposal sites in the area and some, but not all, spill sites.