An aerial photograph of Red Hook, Brooklyn, showing a dense urban area with numerous buildings and streets. The area is surrounded by water, with a large body of water to the left and a smaller body to the right. The image is overlaid with a semi-transparent blue filter. The text is centered in the upper half of the image.

**EXISTING CONDITIONS AND BROWNFIELDS ANALYSIS**  
**RED HOOK, BROOKLYN**

**FINAL**  
**SEPTEMBER 2014**



**BILL deBLASIO**  
MAYOR

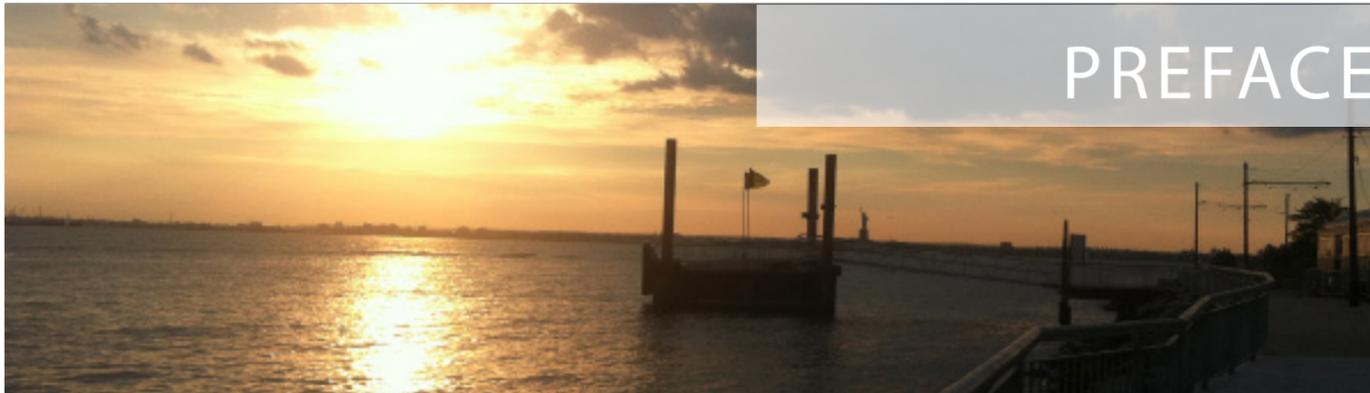
**DAN WALSH**  
DIRECTOR  
Mayor's Office of Environmental Remediation

*This document was prepared by the New York City Department of City Planning for the New York City Mayor's Office of Environmental Remediation and the New York State Department of State with state funds provided through the Brownfield Opportunity Areas Program.*



## CONTENTS

PREFACE	4
EXECUTIVE SUMMARY	5
PART ONE	
Geography and Land Use	9
Demographic and Economic Profile	33
Recent Public Initiatives and Private Investments	41
PART TWO	
Environmental Conditions	48
Strategic Sites	53
Flood Risk and Resiliency	84
KEY FINDINGS AND NEXT STEPS	117
APPENDIX	118



# PREFACE

This document was written to assist planners at community-based organizations with their brownfield and neighborhood revitalization work. It is primarily meant to position the group to advance through the steps of the New York State Brownfield Opportunity Area (BOA) program, but is also useful as documentation of the existing conditions in the study area.

The Brownfield Opportunity Area (BOA) program provides financial and technical assistance to community-based organizations and municipalities working towards the revitalization of areas affected by brownfields. The three-step program, which is funded, administered, and overseen by the New York State Department of State and in New York City, is funded and supported by the New York City Mayor's Office of Environmental Remediation, seeks to produce healthy neighborhoods, people, and economies by capitalizing on existing community resources to redevelop brownfields.

Brownfields are vacant or underutilized properties where contamination or perceived contamination has deterred investment and redevelopment. The vacant and underutilized site, usually a coveted asset in dense and geographically constrained New York City, can become a liability for communities when known or perceived contamination exists. The real or assumed contamination of brownfields distorts the decision-making process for developers, causing them to avoid sites that should otherwise be rational and strategic investments. When brownfields cluster within certain neighborhoods or when property owners or potential developers know or believe that a specific site is severely contaminated, the consequences are many, including: limited economic growth; deferred investment in buildings and infrastructure; and most importantly, the risk to communities of long-term exposure to potentially hazardous substances. New York City has established a wide variety of programs, tools and resources to help communities overcome these obstacles to cleanup and redevelopment. Linkage of the BOA program with resources offered by the Mayor's Office of Environmental Remediation provides communities with powerful tools to identify strategic brownfields, establish community plans for their use, clean up these properties, and implement these plans for redevelopment. In this manner, brownfields can be transformed from liabilities to community assets.

The BOA program is community-based and proactive. In NYC, with the availability of State and City community brownfield planning grants and the active support of the NYC Mayor's Office of Environmental Remediation, BOA provides local community based organizations (CBOs) with the tools and resources to develop and implement grass-roots plans for revitalization of vacant or underutilized land. These include analyses of existing site conditions, the identification of opportunities and priorities for investment and access to assistance in achieving these goals, regular interaction with Mayor's Office of Environmental Remediation staff which acts as ombudsman for CBOs in working with City agencies to implement local plans, direct access to city and state environmental and economic development programs, and peer-to-peer and private-sector partnerships to attract investors.

The three-step BOA process is outlined below:

Step 1: Pre-Nomination Study - Preliminary analysis and initial summarization of opportunities for renewal

Step 2: Nomination Study – Comprehensive analysis and recommendations for revitalization

Step 3: Implementation Strategy – Creation of detailed reuse and redevelopment strategies

In order to expand the BOA program into new communities in NYC, the Mayor's Office of Environmental Remediation is working to identify CBOs in new communities that are seeking the resources that BOA can provide and, using a grant from the New York State Department of State (NYS DOS), is preparing pre-nomination-type reports to initiate the BOA process in these communities.

The following document represents the initial phase of a Step 1 Pre-Nomination study. This document was prepared by the New York City Department of City Planning (NYC DCP) under contract with the NYC Mayor's Office of Environmental Remediation (NYC OER). The purpose of this report is to help initiate the community planning process and enable the development of a community plan for revitalization of brownfields to be performed by local community-based organizations. To complete this Pre-Nomination study, the Southwest Brooklyn Industrial Development Corporation (SBIDC), a local community based organization (CBO), will supplement this report with a community engagement strategy and submit it to the NYS DOS and NYC OER for consideration for additional BOA funding.

The following report provides an overview of the selected area's geologic and natural features, historical development patterns, zoning, land use and infrastructure, as well as demographic and economic profiles, a summary of environmental conditions and a preliminary selection of strategic sites. It is intended to initiate an ongoing process of data collection and analysis to better inform community planning activities and visioning and enable the public to make more informed decisions about their neighborhoods.

# EXECUTIVE SUMMARY

Red Hook, a New York City neighborhood that has a long history related to the working waterfront and New York Harbor, is located in the south-west portion of Brooklyn. The Southwest Brooklyn Industrial Development Corporation (SBIDC), a local community organization in Red Hook, has been awarded funds by the New York State Department of State Brownfields Opportunity Area (BOA) program for community brownfield planning activities. The BOA program aims to empower communities that have been impacted by environmental contamination to develop a comprehensive strategy for economic development and environmental remediation. This 3-step program is funded and administered by NYS DOS and in NYC, is also funded and supported by the NYC OER. It seeks to produce healthy neighborhoods, people and economies by capitalizing on existing community resources to redevelop brownfields. Creation of local employment opportunities, economic revitalization, enhancement of community character and the physical environment, and investment attraction in light of Hurricane Sandy have been identified as major priorities by SBIDC as BOA work moves forward.

## GEOGRAPHY AND LAND USE

Red Hook is roughly defined by the peninsula bounded by the Gowanus Expressway to the north, the Gowanus Canal to the east, Upper New York Bay to the south, and Buttermilk Channel to the west. The Study Area explored in this document is only a portion of Red Hook. It includes the manufacturing zoning districts in the neighborhood, an irregularly shaped area of approximately 400 acres (.6 square miles). It is located in Brooklyn Community District 6.

Red Hook has a rich history as a mixed residential, commercial, and industrial neighborhood. Originally marshland, land was reclaimed and developed for industrial uses related to shipping. As industry grew, residential areas and commercial corridors grew when immigrant workers settled nearby. Today, the waterfront is still dominated by industrial buildings and uses, while the center of the peninsula is largely residential. There are two commercial and retail corridors, Van Brunt and Lorraine Streets.

By the middle of the 20th century, Red Hook had entered steep economic decline. At this time, the Gowanus Expressway and the Brooklyn Battery Tunnel, iconic projects that represent an era of major investments in public works, were completed. While successful in connecting inner Brooklyn with Manhattan, these works effectively isolated Red Hook from the rest of the borough. Further, a shift from manual labor once necessary to load and unload cargo from ships in New York Harbor to a reliance on mechanical systems and shipping containers drew the shipping industry away from Red Hook to larger sites located in New Jersey. The 1990's were characterized by high rates of drug and violent crime, but today the neighborhood has begun to transform yet again. Crime has declined dramatically, and technology start-ups and small-scale manufacturing businesses have begun to locate in Red Hook over the past decade. Other larger investments such as IKEA Home Furnishings and Fairway Supermarket highlighted a new interest in the neighborhood as a regional destination.

## DEMOGRAPHIC AND ECONOMIC PROFILE

Over 10,000 people reside in Red Hook. Largely Hispanic and Black/African American (43 percent and 36 percent respectively as of Census 2010), the population is characterized by lower educational attainment than the rest of the borough and New York City. Nearly 40 percent of residents are living in poverty, and unemployment is 21 percent, more than double unemployment in Brooklyn and New York City. Analysis of firms located in Red Hook and their employees show that the construction, warehousing, manufacturing, and wholesale industries represent the largest share of firms located in Red Hook.

## RECENT PUBLIC INITIATIVES AND PRIVATE INVESTMENTS

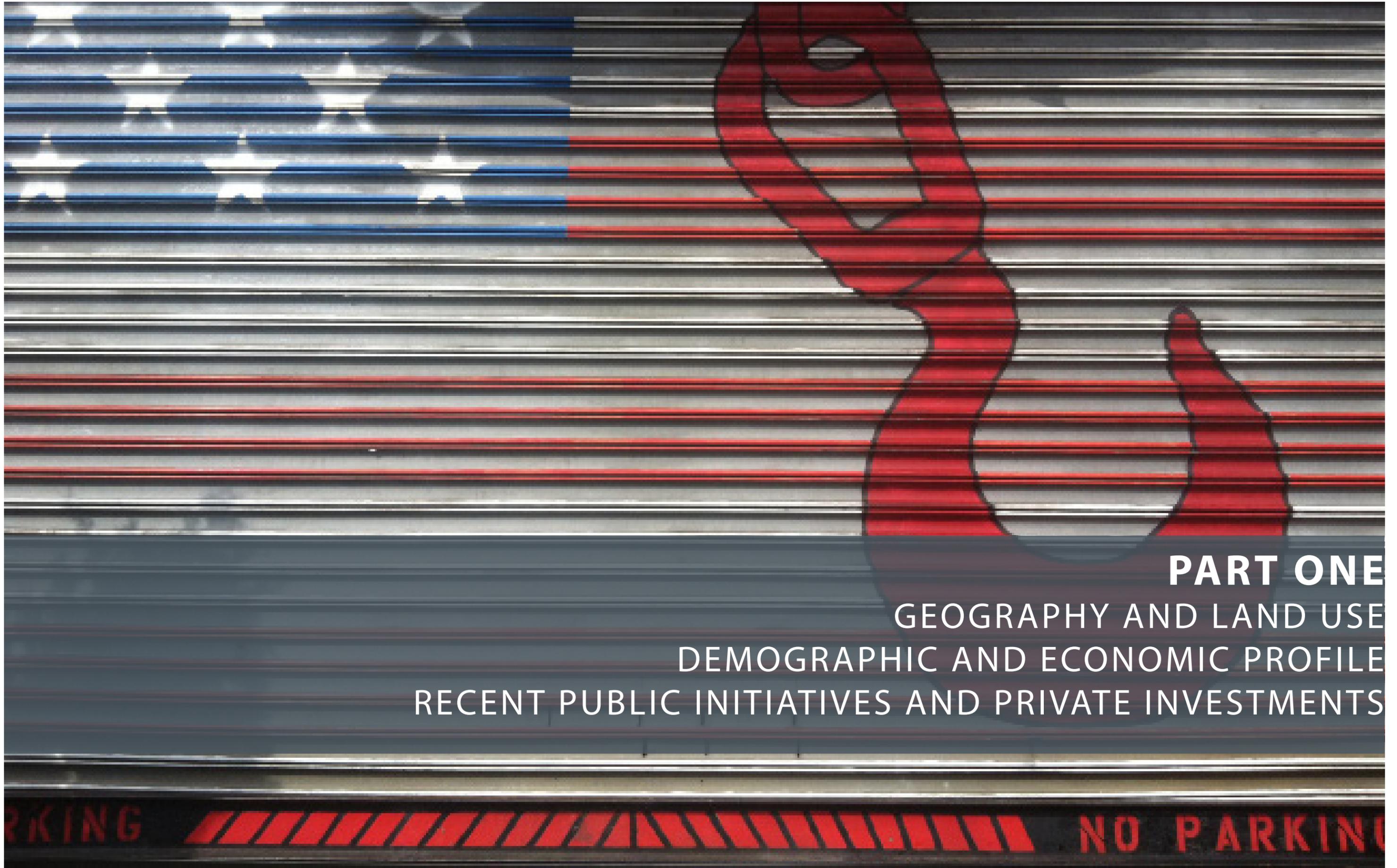
In recent years, some significant investments, such as IKEA home furnishing and Fairway Supermarket, have been made to the neighborhood that may point towards a shift in Red Hook's regional attraction. Private investments have also been made to establish and improve waterfront access resulting in the Columbia Street Esplanade, Erie Basin Park, and Pier 44 Waterfront Garden. Another major development is the Federal Superfund designation of Gowanus Canal which became contaminated over a century of industrial uses, dumping, and sewage overflows.

## ENVIRONMENTAL CONDITIONS

Environmental contamination is prevalent in areas with current and historic industrial activity. Further, in waterfront neighborhoods like Red Hook, it is also common that fill materials used to make marsh-land suitable for industry contribute to widespread contamination. Industrial uses related to shipping, processing of petroleum products, chemical compounding, and manufacturing pose a risk of contamination. This contamination may be a deterrent to investment as it can be costly and time consuming to remediate. This study identifies 14 strategic sites located throughout the Study Area that highlight environmental issues and, in turn, provide a basis for the community planning process.

## FLOOD RISK AND RESILIENCY

Red Hook was badly impacted by Hurricane Sandy in October 2012. While the neighborhood has recovered somewhat since Sandy, many uncertainties remain. The results of an extensive field survey are presented in this study and illustrate a complicated set of development challenges related the impact of Hurricane Sandy and future flood resiliency. Understood within the context of an evolving regulatory environment related to flood insurance and flood resiliency, this study highlights potential challenges and opportunities that Red Hook may face in the long-term.



**PART ONE**

GEOGRAPHY AND LAND USE

DEMOGRAPHIC AND ECONOMIC PROFILE

RECENT PUBLIC INITIATIVES AND PRIVATE INVESTMENTS

NO PARKING

NO PARKING

## Data Sources

### **Primary Land Use Tax Lot Output (PLUTO)**

*Primary Land Use Tax Lot Output (PLUTO) represents a compilation of data from the NYC Department of Finance and the Department of City Planning. It includes primary tax lot and building characteristics such as land use, ownership, year built, number of units, lot and building size, allowable and built floor area ratio (FAR), and the presence of historic districts or landmarks.*

### **The American Community Survey (ACS)**

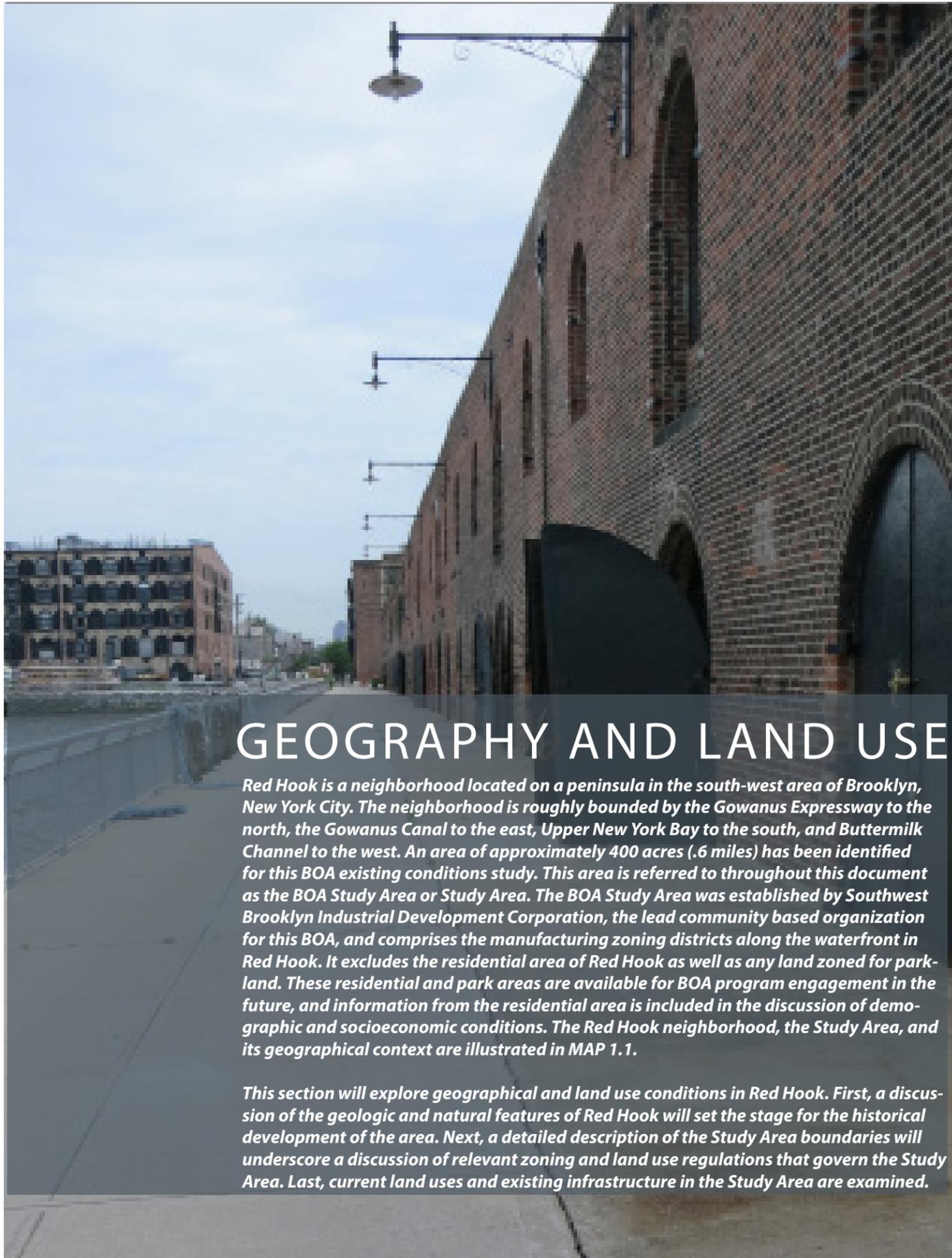
*The American Community Survey (ACS) is an ongoing survey conducted by the Census Bureau that provides data every year giving communities the current information they need to plan investments and services. The American Community Survey includes questions that are not asked by the 2010 Census, and the two serve different purposes.*

### **United States Decennial Census**

*The U.S. Census counts every resident in the United States and takes place every 10 years. The data collected by the decennial census determine the number of seats each state has in the U.S. House of Representatives and is also used to distribute billions in federal funds to local communities.*

### **The Quarterly Census of Employment and Wages (QCEW)**

*The Quarterly Census of Employment and Wages (QCEW) produces a comprehensive tabulation of employment and wage information for workers covered by State unemployment insurance (UI) laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. The data are provided to the Department of City Planning (DCP) by the New York State Department of Labor (NYS DOL), and are geocoded and analyzed by DCP.*

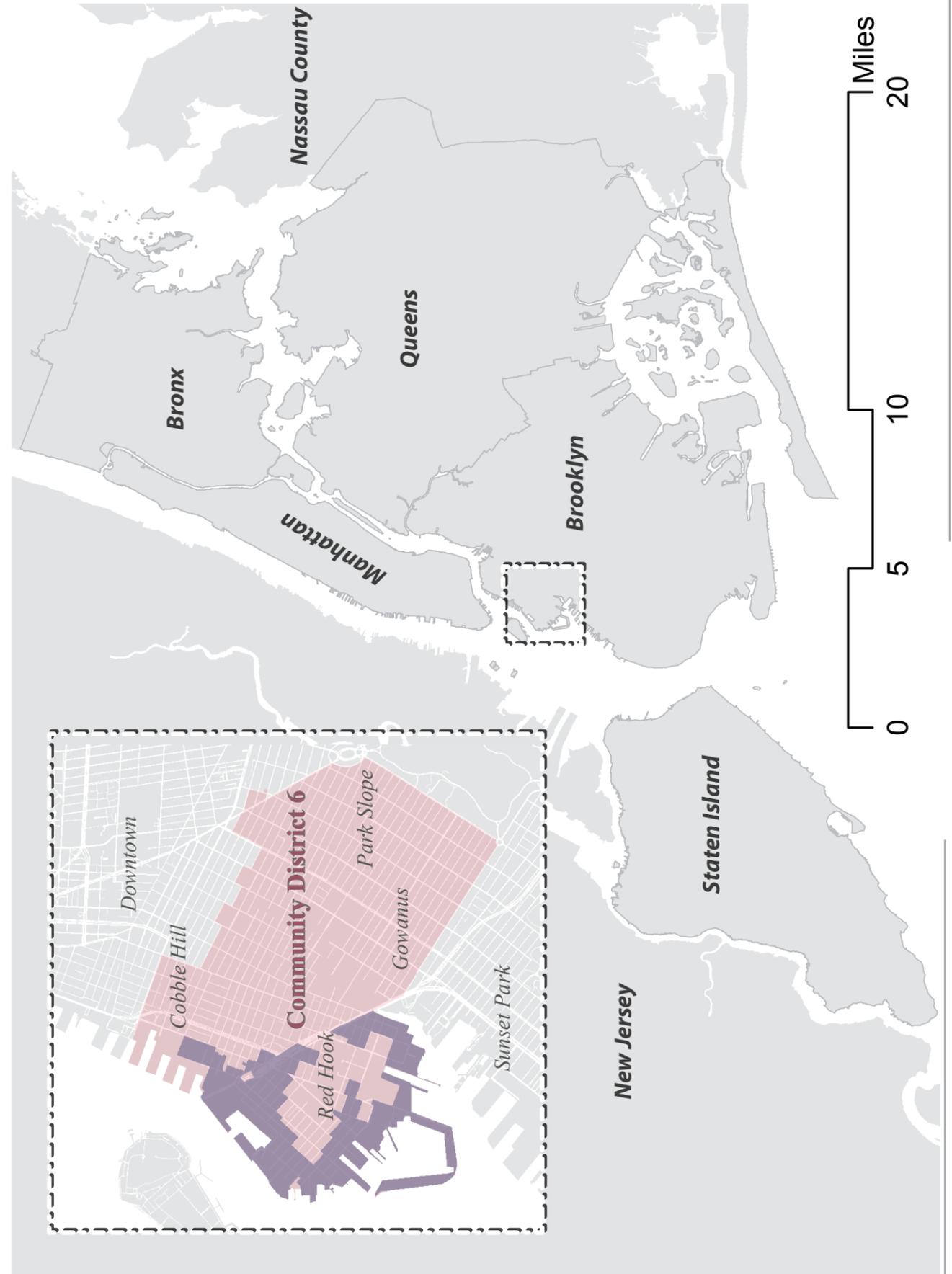


## GEOGRAPHY AND LAND USE

*Red Hook is a neighborhood located on a peninsula in the south-west area of Brooklyn, New York City. The neighborhood is roughly bounded by the Gowanus Expressway to the north, the Gowanus Canal to the east, Upper New York Bay to the south, and Buttermilk Channel to the west. An area of approximately 400 acres (.6 miles) has been identified for this BOA existing conditions study. This area is referred to throughout this document as the BOA Study Area or Study Area. The BOA Study Area was established by Southwest Brooklyn Industrial Development Corporation, the lead community based organization for this BOA, and comprises the manufacturing zoning districts along the waterfront in Red Hook. It excludes the residential area of Red Hook as well as any land zoned for park-land. These residential and park areas are available for BOA program engagement in the future, and information from the residential area is included in the discussion of demographic and socioeconomic conditions. The Red Hook neighborhood, the Study Area, and its geographical context are illustrated in MAP 1.1.*

*This section will explore geographical and land use conditions in Red Hook. First, a discussion of the geologic and natural features of Red Hook will set the stage for the historical development of the area. Next, a detailed description of the Study Area boundaries will underscore a discussion of relevant zoning and land use regulations that govern the Study Area. Last, current land uses and existing infrastructure in the Study Area are examined.*

Map 1.1 Community Context



## GEOLOGIC AND NATURAL FEATURES

Named for its red clay soil and the distinctive shape of the peninsula, marshy land in Red Hook remained largely undeveloped through the 18th century. Topographically, Red Hook is a low-lying area that is bounded by several water bodies. As shown below in Map 1.2, Red Hook is a peninsula surrounded mainly by the Upper New York Bay. From west to east, Red Hook is surrounded by the Buttermilk Channel (a small tidal strait in Upper New York Bay, approximately one mile long and one-fourth of a mile wide which runs between Brooklyn and Governor's Island), the Gowanus Bay, and the Gowanus Canal. There are two man-made water bodies in Red Hook along the waterfront: the Atlantic and Erie Basins, both constructed in the mid-19th century. Originally a tidal inlet of navigable creeks and saltwater marshland and meadows, the area was once rich with fish and other wildlife. Henry Hudson and Giovanni da Verrazzano both navigated the inlet of the Gowanus Canal in their explorations of New York Harbor.

There are several tidal wetlands and littoral zones that are mapped below using information sourced from the New York State Department of Environmental Conservation (NYS DEC) and the United States Fish and Wildlife Service National Wetlands Inventory (USFWS NWI). There are tidal wetlands registered with the New York State Official Tidal Wetlands Inventory, maintained by NYS DEC Bureau of Marine Resources in the Tidal Wetlands Inventory and Geographic Information System Unit.<sup>i</sup> The surrounding water bodies are mainly characterized by the USFWS NWI as Estuarine and Marine Deepwater Wetlands, which are defined as open water estuaries, bars, sounds, and open oceans. Littoral Zones, found mainly along the waterfront in Red Hook, are tidal wetland zones that include all lands under tidal waters which are not included in any other category listed under the Tidal Wetlands Inventory.<sup>ii</sup> In coastal environments the littoral zone (or intertidal zone) extends from the high water mark, which is rarely inundated, to shoreline areas that are permanently submerged, such as a sea, lake, or river. There are also areas of Estuarine Marine Wetlands near the Pier 44 Waterfront Garden, also shown in Map 1.2. These areas are defined by the USFWS NWI as coastal areas with vegetated and non-vegetated brackish and saltwater marsh, shrubs, beach, bar, shoal or flat. As shown below in Map 1.2, the elevation of the peninsula is low-lying, especially along the waterfront where ground elevations are mainly below 10 feet above sea-level. This makes Red Hook prone to flooding, an issue that will be discussed in detail later in this report.

Together, the water bodies surrounding the Red Hook Peninsula form part of the New York-New Jersey Estuary, which supports a wide variety of marine life, including arthropods such as the American lobster, and several species of crab, marine mammals such as the bottlenose dolphin, grey seal, harbor seal, and North American river otter, and a rich variety of fish and bird life. In 2007, researchers at the Cornell University Lab of Ornithology and the NYS DEC recorded acoustic data of whale vocalizations of at least six species of whale within the NY-NJ Estuary.<sup>iii</sup> The estuary suffered greatly from pollution due to the industrialization and development of New York Harbor and port, but is now considered to be recovering. According to the U.S. Fish and Wildlife Service, the administering body of the National Wetlands Inventory, "wetlands provide a multitude of ecological, economic and social benefits. They provide habitat for fish, wildlife and a variety of plants. Wetlands are nurseries for many saltwater and freshwater fishes and shellfish of commercial and recreational importance. Wetlands are also important landscape features because they hold and slowly release flood water and snow melt, recharge groundwater, recycle nutrients, and provide recreation and wildlife viewing opportunities for millions of people."<sup>iv</sup>

The entire area is located in the Atlantic Ocean/Long Island Sound Watershed, which drains 1,650 square miles of land area within New York State including most of the New York City Metropolitan Area and all of Long Island and encompasses all marine waters in New York Harbor, Long Island Sound, Block Island Sound, and along the South Shore of Long Island, as well as the fresh waters that drain into them.<sup>v</sup>

Map 1.2 Water Resources and Topography



## HISTORICAL DEVELOPMENT

Historically used for manufacturing and industrial uses along the waterfront, Red Hook is adjacent to the neighborhoods of Gowanus, Carroll Gardens and Cobble Hill. Established as the Dutch village of Roode Hoek in 1636, Red Hook was one of the first areas to be settled in Brooklyn. Named for its red clay soil and the distinctive shape of the peninsula, its marshy land remained largely undeveloped until the construction of the Atlantic, Erie, and Brooklyn Basins. These artificially enclosed areas are typically designed so that the water level remains unaffected by tidal changes and ultimately allow large ships to dock, undergo repairs, and unload goods along Red Hook's waterfront. In the 1840s the peninsula began to grow into one of the busiest shipping centers in the United States. The success of the pier and dock infrastructure led Colonel Daniel Richards, a local developer responsible for the first steam grain elevator in the Port of New York, to petition the City of Brooklyn to lay a street grid around the Atlantic Basin. This action connected Red Hook's waterfront to the rest of South Brooklyn in 1847. Between the Civil War and the early half of the 20th century, Red Hook's piers received and unloaded cargo from all over the world. The neighborhood hosted thousands of workers, mainly Italian and Irish American immigrants.

To serve these populations, The Red Hook Houses were constructed in 1938 for families of dockworkers and longshoremen. This was one of the first and largest Federal Housing projects in the United States under President Franklin Delano Roosevelt's Federal Works Program. Prior to the construction of the Red Hook Houses, thousands of workers lived in row houses in the area.

The bustling port area was ideal for firms both directly and indirectly related to shipping. During the 19th century, manufacturing firms in the area included a steam pump factory, the Esler and Company Boiler Factory, the New York Patent Felt Company, and the Brooklyn Clay Retort and Fire Brick Company. The Erie Basin Iron Works manufactured steam engines, and its location close to the waterfront on Van Dyke Street made it possible for ships to undergo machinery repairs and hull servicing simultaneously. By the turn of the century, the New York Dock Company was one of the largest employers in Red Hook, providing loading and unloading services for ships. In 1908 the New York Dock Company constructed large, concrete warehouses on Imlay Street, setting the stage for similar built structures in the area. Nearby, paint companies including the American Marine Paint Company, established operations in the open spaces near Clinton, Columbia, and Otsego Streets where they were relatively removed from residential areas. The fumes from their operations were contained in concrete factories. Today, the built environment of Red Hook illustrates the roots of this working waterfront history. There are currently two city landmarks in Red Hook that reflect this history: the Brooklyn Clay Retort and Fire Brick Works Storehouse and the Sol Goldman Pool at the Red Hook Play Center, built in 1936 to serve the area's working class residents.

By the late 1940's, the industries fed by ship repair and service during World War II showed signs of decline due to inadequate infrastructure systems. The advent of cargo containerization in the 1960's lessened the need for smaller port facilities like those found in Red Hook. With many firms abandoning Red Hook for larger spaces in New Jersey, unoccupied and largely undesirable land was acquired by the City of New York in order to revitalize the waterfront and the port.

At this time, reconstruction involving the demolition of many Civil War-era warehouses began. Due in part to the exodus of large shipping companies from New York and the decline of dock infrastructure, in 1962 an Urban Renewal Plan was announced to clear the entire neighborhood around the Atlantic Basin to support the construction of a huge container port. As a result, today the Red Hook Marine Terminal is a dominating feature of Red Hook's waterfront. In 1972, in response to overall disinvestment in building upkeep and uncertainty in the neighborhood, the City Planning Commission and the Board of

1911 Lithograph of the  
New York Dock Company  
holdings on the Brooklyn Waterfront



Estimate approved the designation of the Red Hook Industrial Urban Renewal Area (CP-21874 superseded by CP-22020) and an Urban Renewal Plan (CP-21875 superseded by CP-22021). The URA and URP included 230 acres for the port covering the waterfront in Red Hook and the Columbia Street Waterfront, a waterfront park, and 225 units of housing for displaced residents. In 1974, the City began property acquisition, but discontinued work on the project in light of the 1975 fiscal crisis. Around the same time, an attempt was made to address needed infrastructure improvements and to reduce sewage outflows into nearby waterways. The Red Hook Water Pollution Control Project was undertaken to establish interceptors, infrastructure that controls the flow of waste water and sewage, down Columbia Street from De Graw to President and then down President to Hamilton Avenue and on to Red Hook. Plagued by building collapses as a result of the construction, multiple fatalities, and the fiscal crisis, sewer construction was interrupted and a number of buildings were condemned and demolished.

In 1979, the Port Authority of New York proposed a scaled down plan for the container port and the City Planning Department responded with a revised Urban Renewal Plan (790082 HGK, 790083 HUK). The Red Hook Industrial Urban Renewal Area was also modified, removing a large portion of Red Hook south of the Atlantic Basin and adding smaller portions of the Columbia Street Waterfront neighborhood (790086 HGK, 790086 HUK). Ultimately, the street which once extended into the Red Hook Marine Terminal was de-mapped in 1981- effectively removing the last remnants of the neighborhood that once existed west of Van Brunt Street (810418 MMK).

Red Hook's relative isolation from the rest of the borough of Brooklyn is a result of the construction of the Gowanus Expressway in 1946, the 1950 opening of the Brooklyn Battery Tunnel, and the removal of trolley service in the 1950's. Lack of public transit access to the NYC subway system magnifies this sense of isolation (Map 1.11). The exodus of industry in the 1960's led the neighborhood towards economic decline. By 1990, high crime and drug violence, poverty and unemployment, illegal dumping, and the decay of the built environment were pervasive. At this time, LIFE magazine declared Red Hook as the "crack capital of America" and listed the neighborhood as one of the "worst" in the United States. Due in part to this decline, in 1994, Brooklyn Community Board 6 submitted a 197-a plan, "Red Hook: A Plan for Community Regeneration." The plan responded to growing community concerns over the lack of economic growth, housing, open spaces and waterfront access, quality of life, transportation access, and a need to minimize conflicts between the industrial areas and residential communities. It was modified and adopted by the City Planning Commission in September 1996.

Today, Red Hook is undergoing another transformation. Crime has been steadily decreasing with an overall 76 percent decline in felony offenses since 1990.<sup>vi</sup> In recent years, artists seeking low rents and technology and start-up firms have located in Red Hook for office and studio spaces. While some of the newer developments have been controversial, art

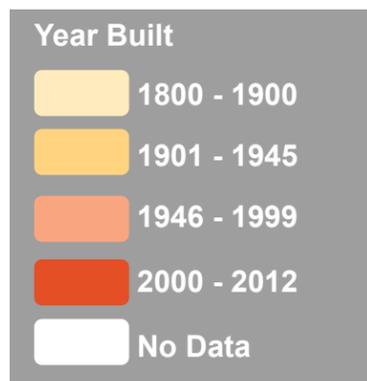
festivals along the waterfront, new commercial uses along Van Brunt Street, and ferry service between Manhattan and IKEA have brought a new dynamic to Red Hook.

Several land-use developments including the IKEA home furnishing store, Fairway Market grocery store, and the Brooklyn Cruise Terminal have begun to shape Red Hook as a destination neighborhood. Recent development in Red Hook has built on the area's industrial roots, but has also brought a new dynamic of commercial and residential life. Major developments in the area include IKEA, which opened a 346,000 square foot location in June 2008. This expansive home furnishings store replaced a 19th century working dry dock. Fairway supermarket, located at the terminus of Van Brunt Street, has also added to a new development scheme in Red Hook. Located in a civil-war era building constructed by William Beard in the 1870's, Red Hook Stores Warehouses originally served shipping activities in the Erie Basin. The property and the surrounding area underwent a mixed-use rezoning (Special Mixed Use District - 5) in 2002. Greg O'Connell, a prominent land owner in the area, then purchased the property from the NYC Economic Development Corporation, and restored the building to accommodate the Fairway Market and residential units on the upper floors. The site was largely underutilized for many years and at times vacant. Fairway Market opened on the site in 2006. Across Van Brunt Street, Pier 41, also known as Merchant Stores, consists of two large brick warehouses. Originally built in 1873, it was recently rehabilitated and now offers spaces for light manufacturing and commercial businesses enriching the fabric of local artisans and supporting the preservation of the historical industrial built character. Lastly, the Atlantic Basin remains one of the most iconic images of the working waterfront in Red Hook for 165 years. Originally built to accommodate large ships crowded out of Manhattan's waterfront, it was also the site of the first steam grain elevator in the Port of New York, processing bulk grains moving through the Erie Canal. Today, it is the site of Brooklyn Cruise Terminal on Pier 12, accommodating ships such as the Queen Mary 2 and the Caribbean Princess, as well as the Brooklyn Container Terminal.

On October 29, 2012, Hurricane Sandy and the resulting storm surge flooded nearly the entire Red Hook peninsula, leaving the Red Hook Houses without electricity and rendering many of the businesses out of service. The recovery from this storm is ongoing and is the subject of analysis later in this report.

Map 1.3 shows the historical ages of buildings in Red Hook, a significant portion of which were built in the 19th century. This may indicate challenges with regards to future storm and climate resiliency. Older buildings may be difficult to retrofit to mitigate the risk of damage by future storm events and predicted sea-level rise.

Map 1.3 Year Built



Map 1.4 Historic and Current Shoreline



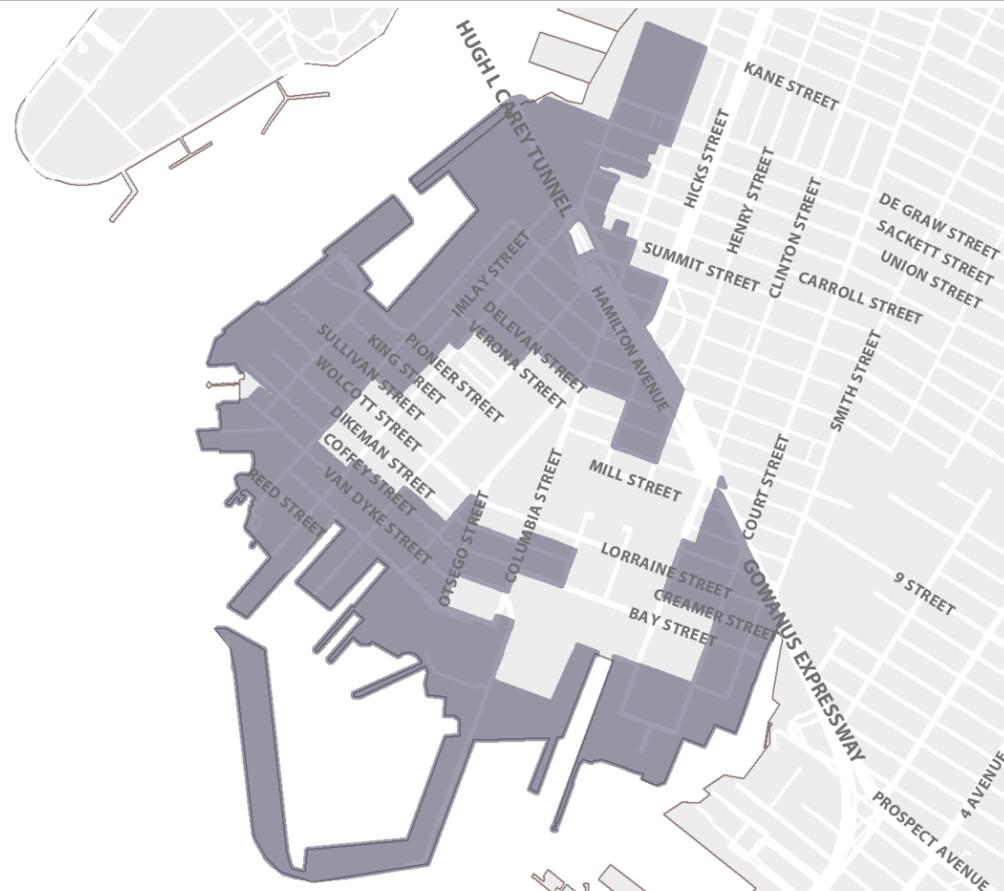
Source: Plan of the town of Brooklyn and part of Long Island; Ratzel, Bernard; Accessed New York Public Library, Digital ID T811319

# STUDY AREA BOUNDARY JUSTIFICATION

The proposed boundary of the Red Hook BOA was established by the Southwest Brooklyn Industrial Development Corporation, the lead community based organization for the BOA, and aligns with the manufacturing zoning districts along the waterfront in Red Hook to reflect the group's interest in manufacturing job creation. The Study Area excludes the residential area of Red Hook as well as any land zoned for parkland. These areas are available for BOA engagement in the future, and information from the residential area is included in the discussion of demographic and socioeconomic conditions. The Study Area extends slightly north of the Gowanus Expressway including the full extent of the M1-1 District that reaches extends north-ward to Kane Street. This neighborhood was chosen based on a prevalence of current and historic industrial uses, the number of vacant lots, and the likelihood of environmental contamination based on current and historical industrial uses. The history of industrial and manufacturing uses in the M-zones contribute to the likelihood of environmental contamination and brownfields and justifies BOA work in Red Hook. This boundary allows for a focused analysis of industry and the waterfront in Red Hook.

Today, much of the area is used for industrial purposes and is dominated by industries such as construction, transportation and warehousing, and manufacturing. There are a significant number of vacant sites which may remain un-developed potentially due in part to environmental contamination. Further, the area is under considerable risk of flooding, and future development hinges on an evolving regulatory environment in light of Hurricane Sandy. Vulnerability to flooding increases risk for environmental contamination and cross contamination of hazardous materials throughout the area. The extent of flood vulnerability in Red Hook is the subject of analysis later in this report and will be a crucial consideration as BOA work moves forward.

**Map 1.5 BOA Study Area and Local Roadways**



# ZONING

For the purposes of this report, the Red Hook Study Area is bounded by the manufacturing zoning districts in Red Hook including several blocks incumbent in the M1-1 and M2-1 districts that straddle the Gowanus Expressway. This is the same area that SBIDC will study in its Step 2 BOA work.

Historically, zoning has allowed for a range of industrial activities and intensities of uses, and the built environment of the Study Area reflects Red Hook's historical working waterfront. Zoning in the area has remained largely the same since the 1961 Zoning Ordinance with a few exceptions. Map 1.6 depicts zoning changes that have been adopted since 1961 relevant to Red Hook. These changes include the introduction of a Special Mixed Use District (MX-5), adopted in 2002, where industrial and residential uses are permitted to co-exist. Other changes that have taken place include the creation of an M1-1 District on the site of IKEA where the zoning had historically been M3-1. An M1-2 District was also mapped along Beard Street where zoning was historically M1-1. Adjacent to the Study Area and north of the Gowanus Expressway, the Carroll Gardens / Columbia Street Re-zoning was adopted in October of 2009 and responded to community concerns about recent out-of-scale development permitted under the 1961 zoning. By mapping contextual districts with height limits to preserve the existing built character, new development and modest expansions are allowed where appropriate and at a height and scale that is in keeping with the built character.

Land uses within the Study Area are largely industrial, and the built environment is characterized by many low, often single-story buildings and warehouses. There is a significant amount of vacant land. This pattern is common in areas with the zoning districts that are found in Red Hook.

There is a range of existing zoning districts within the Study Area including those that allow for varying intensities of industrial uses as well as a few residential and commercial districts. Map 1.6 displays the current zoning districts within the Study Area, and Table 1.1 outlines the typical uses found in the manufacturing and commercial districts found in the Study Area.

**Table 1.1 Zoning District**  
Source: DCP

District	Allowable Uses	Maximum FAR
<b>M1-1 / M1-2</b>	Typically includes light industrial uses, such as woodworking shops, repair shops, and wholesale service and storage facilities. Some community facilities and hotels are allowed in M1 districts.	1.0 / 2.0
<b>M2-1</b>	Typically includes medium-intensity industrial uses including those with higher levels of noise, vibration, and smoke except when bordering a residential area. Industrial activities must be entirely enclosed.	2.0
<b>M3-1</b>	Designated for area with heavy industries that generate noise, traffic, or pollutants and typically include uses such as power plants, solid waste transfer facilities and recycling plants, and fuel depots	2.0
<b>MX-5; M1-1/R5</b>	Mixed use district where an M1-1 district is paired with an R5 district and new residential and non-residential uses are permitted as-of-right within the zoning district, block, or building. Mixed Use District-5 (MX-5): Red Hook was adopted in January, 2002.	1.25

Map 1.6 Historic and Current Zoning Regulations



## LOCAL POLICY CONTEXT

Portions of the area within the proposed Red Hook BOA have local policies and incentive programs that guide land use and development beyond zoning regulations.

### Southwest Brooklyn Industrial Business Zone

The Southwest Brooklyn Industrial Business Zone (IBZ) is captured in the Study Area and is meant to foster the development of industrial and manufacturing activities. According to the New York City Economic Development Corporation, the administering body of IBZs, "IBZs are supported by tax credits for relocating within them, zone-specific planning efforts, and direct business assistance from Industrial Providers of NYC Business Solutions Industrial and Transportation."<sup>vii</sup> The IBZ extends through the manufacturing zones of Red Hook, Gowanus, and Sunset Park. The boundaries of the IBZ were recently modified and are reflected in the following Map 1.7.

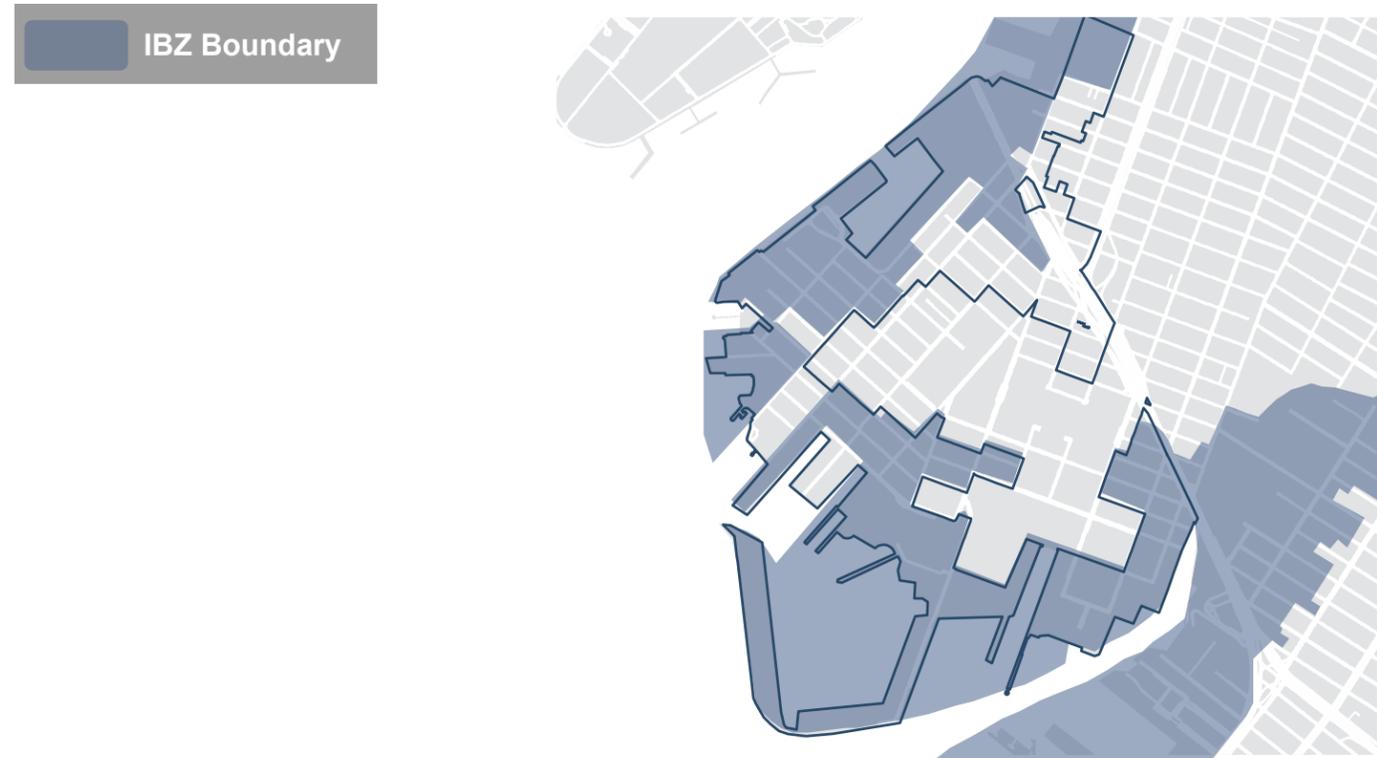
### NYC Waterfront Revitalization Plan

Portions of the Red Hook waterfront (The Red Hook Marine Terminal and Sunset Park/Erie Basin) are included as Significant Maritime and Industrial Areas (SMIAs) and Priority Marine Activity Zones (PMAZs) as identified in the Waterfront Revitalization Program (revisions to the Waterfront Revitalization Plan (WRP) were adopted by the City Council in October 2013 and are pending New York State and Federal approval). These areas are mapped below in Map 1.8. The New York City Waterfront Revitalization Program (WRP) is the City's principal coastal zone management tool. It establishes the City's policies for development and use of the waterfront and provides the framework for evaluating the consistency of local, state, and federal discretionary actions in the Coastal Zone. The Coastal Zone Boundary is a defined area which includes all waterfront land up to the first upland street at least 300 feet inland. It also includes all coastal wetlands, waterfront parks, floodplains, and other significant coastal features. SMIAs are working waterfront uses that have locational requirements that make portions of the Coastal Zone especially valuable as industrial areas. As the policy states, the operation and expansion of these activities should comply with applicable state and national air quality standards for industrial and maritime areas. PMAZs are special area designations that assist WRP consistency review. These zones are areas with concentrations of waterborne transportation uses and are important nodes that support the city's waterborne transportation and maritime activities. These areas are characterized by shorelines used for vessel docking, berthing, or tie-up and where the maritime infrastructure—such as bulkheads, docks, piers, and fendering—is designed to support such uses.

### NYS Environmental Zone

A significant portion of the Red Hook neighborhood (census tracts 85 and 59 shown above in Map 2.1), is included in a New York State Environmental Zone (EN-Zone). Administered by the Empire State Development Corporation, the EN-Zone provides enhanced tax credits for brownfield cleanup, redevelopment, real property taxes and the purchase of environmental insurance if a cleanup is done in the NYS Brownfield Cleanup Program. Designation of an EN-Zone is limited to census tracts with a poverty rate of at least 20 percent according to the 2000 Census and an unemployment rate of at least 125 percent of the New York State average, or a poverty rate of at least double the rate for the county in which the tract is located.<sup>viii</sup> According to the 2000 Census, 52 percent of people were living below the poverty level.

Map 1.7 Southwest Brooklyn Industrial Business Zone



Source: EDC

Map 1.8 Significant Marine and Industrial Area, Priority Marine Activity Zones, and Coastal Zone



Source: DCP

## Open Industrial Uses Study (OIUS)

Done in partnership with DCP, DEP, and the NYC EDC, the Open Industrial Uses Study is intended to review the City's industrial policies including Industrial Business Zones (IBZs) and Significant Maritime and Industrial Areas (SMIAs). Portions of the Red Hook BOA Study Area are included as an IBZ (Southwest Brooklyn IBZ) and a SMIA (Brooklyn waterfront from Pier 6 through the Red Hook Container Terminal). The study focuses on six primary use categories including concrete, recycling, auto salvage, scrap metal, non-putrescible waste, and storage all of which are permitted uses in the city's manufacturing districts.

Despite advances in technology, the establishment of best management practices, stricter federal air and water quality standards, and zoning standards (Section 42-20), the performance standards of open industrial uses in New York City have not changed since the adoption of the 1961 Zoning Resolution. A variety of other laws and regulations also apply, but regulatory gaps and enforcement challenges exist, and some facilities do not comply with contemporary industrial and environmental standards.

The recommendations of the study include regulatory amendments to the Zoning Resolution, Building Code, and Air Pollution Control Code that will improve environmental conditions in industrial areas, support economic development, and protect communities. Specifically, the proposed amendments to the Zoning Resolution would require existing and new open industrial uses to comply with prescriptive site design standards rather than performance standards. The performance standards in the 1961 Zoning Text are inconsistent with newer, superseding codes that offer more comprehensive regulations for environmental performance in New York City. The new site design standards are consistent with national best practices and include paving, grading, drainage, landscaping and planting techniques, as well as containment infrastructure designed to improve water and air quality.

# LAND USE

Current and historical zoning frames how land use in Red Hook is understood. Zoning has allowed for a range of industrial activities and intensities of uses, and the built environment of the Study Area reflects Red Hook's history rooted in the working waterfront. Land uses in Red Hook reflect the current zoning for manufacturing uses as well the historical context of the area. Today, development is guided by these zoning districts and the presence of the Southwest Brooklyn Industrial Business Zone (IBZ) (see Map 1.7).

An analysis of land use within the Study Area has been conducted using the City's Primary Land Use Tax Lot Output (PLUTO) data which contains detailed information about land in New York City including but not limited to land use designation, year built, number of units, allowable and built floor area ratio (FAR), and lot and building sizes. This data reflects pre-Hurricane Sandy conditions and must be understood within this context. Overall, land uses are largely industrial, and the built environment is characterized by many low, often single-story buildings and warehouses. There is a significant amount of vacant land. Within the Study Area, there are some pre-existing non-conforming residential uses which will be discussed in this section of the study.

While approximately a quarter of all tax lots in Red Hook are used for industrial and manufacturing purposes, they make up nearly half of the total lot area. As shown in the following land use map (Map 1.9), there is little green space in the Study Area. Residential uses only occupy 3 percent of the total lot area. In the Study Area, there are a total of 799 residential units distributed among mixed use, multifamily walk-up, and one-to-two family buildings. Approximately 9 percent of the total lot area is vacant in the Red Hook Study Area- nearly triple that of the rest of the borough.

The share of lot area allocated towards each land use differs at the neighborhood, borough, and city-wide level as shown in Table 1.2. In the Study Area, 48 percent of the total lot area is dedicated to Industrial/Manufacturing. Only 5 percent of Brooklyn and 4 percent of New York City are used for Industrial/Manufacturing. In the Study Area, a significantly higher percentage of land is used for parking facilities (5 percent) than the rest of New York City and Brooklyn. The Study Area appears to have significantly less open space than the rest of New York City and the borough, but this analysis does not capture the large amount of space dedicated to parks and other waterfront access areas, specifically the Columbia Street Esplanade and the Pier 44 Waterfront Garden immediately outside of the Study Area boundaries. Residential uses only make up 3 percent of the total lot area of the Study Area. This differs from Brooklyn and the rest of New York City where residential uses are a significant portion of land use for Brooklyn and the city totaling 40 percent and 39 percent respectively excluding mixed commercial and residential buildings. As Table 1.3 illustrates, 192 of the 914 tax lots in the Red Hook Study Area (or approximately 10 percent of the total lot area) are vacant, with no built structure.

Within the proposed BOA boundaries, 14 percent of all lots are city-owned. These lots account for 5 percent of the total lot area in Red Hook. A significant area, 6 percent, is publicly owned by a public authority, state, or federal entity. This is due largely to the presence of the Brooklyn Container Terminal, a very large site that is publicly owned and operated by the Port Authority of New York and New Jersey. Of all the tax lots in the Study Area, 3 percent are under mixed ownership. These properties are fully tax exempt and may be owned by the city, state, or federal government, a public authority, or a private institution. The majority of lots (84 percent) and lot area (86 percent) in the Study Area are under private ownership.

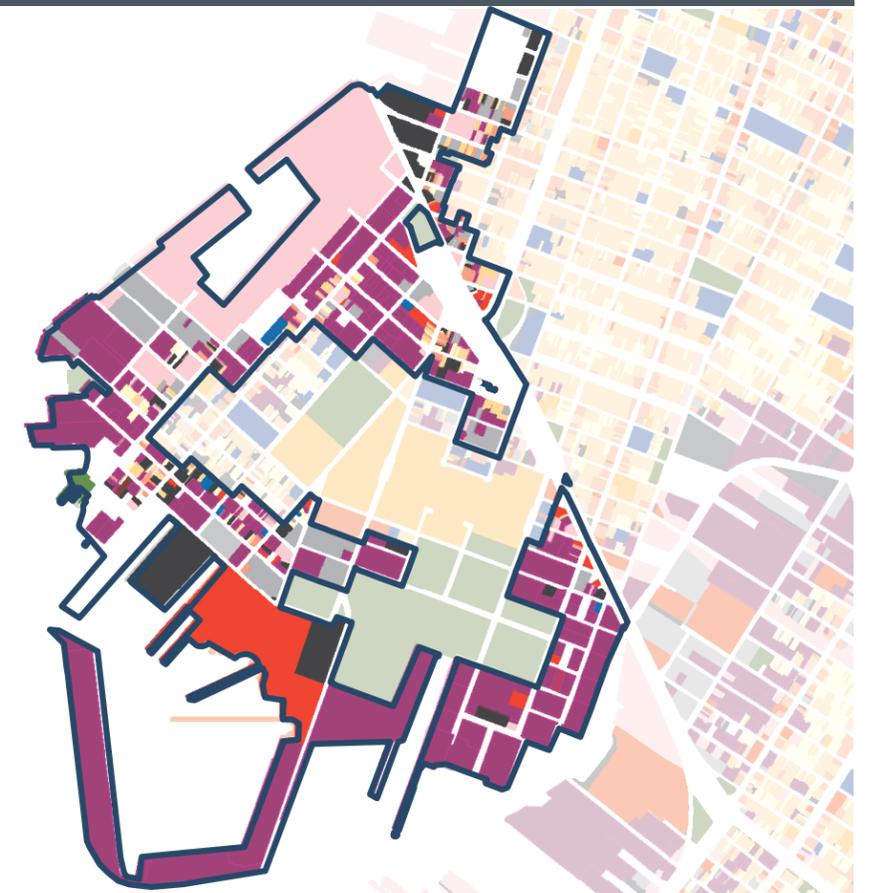
On the rest of the peninsula, beyond the bounds of the Study Area, land use is dominated by residential uses, particularly in Red Hook Houses, and very large areas dedicated to park space in the Red Hook Recreation Center and Coffey Park. Van Brunt and Lorraine Streets

are the dominant commercial corridors in Red Hook and serve the community with small scale retail services. While the majority of the area is zoned for manufacturing and industrial uses, the Van Brunt Street commercial corridor is gaining strength, and an IKEA and Fairway Supermarket have added commercial anchors and regional destinations to the waterfront. In addition, the Lorraine Street commercial area (between Otsego and Hicks Street) offers retail such as a grocery store and bank that are well utilized by residents of Red Hook Houses.

**Table 1.2. Comparative Land Use**  
Source: PLUTO 2012

Building Type	Red Hook	Brooklyn	NYC
One & Two Family	1%	23%	27%
MultiFamily Residential	1%	17%	12%
Mixed Commercial/ Residential	1%	4%	3%
Commercial/ Office	14%	3%	4%
Industrial/ Manufacturing	48%	5%	4%
Transportation/ Utility	9%	3%	7%
Public Facilities & Institutions	1%	6%	7%
Open Space	1%	35%	27%
Parking Facilities	5%	2%	1%
Vacant Land	9%	3%	6%
No Data*	10%	1%	2%
<b>Grand Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Map 1.9 Land Use**



Source: DCP, PLUTO 2012

**Table 1.3 Land Use in Red Hook**

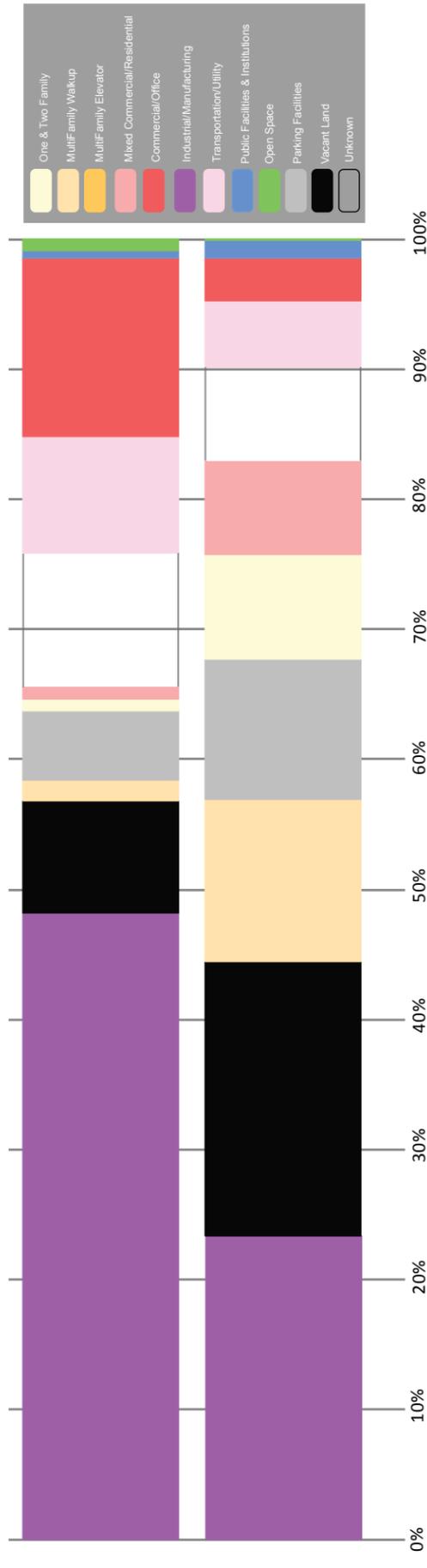
Land Use	Total Tax Lots	% Tax Lots	Total Lot Area (sq ft)	% Lot Area	Total Building Area (sq ft)	% Building Area
Commercial/Office Building	30	3%	2,229,280	14%	550,300	6%
Industrial/Manufacturing	214	23%	7,809,336	48%	4,841,241	53%
Mixed Commercial/Residential Building	66	7%	152,993	1%	275,169	3%
MultiFamily Walkup Building	114	12%	242,488	1%	388,661	4%
One & Two Family Building	73	8%	140,071	1%	133,223	1%
Open Space	1	0%	138,600	1%	2,400*	0%
Parking Facilities	99	11%	872,573	5%	161,218	2%
Public Facilities & Institutions	12	1%	98,558	1%	133,079	1%
Transportation/Utility	47	5%	1,448,807	9%	2,042,117	23%
Vacant Land	192	21%	1,405,709	9%	-	-
Unknown	66	7%	1,665,050	10%	541,453	6%
<b>Grand Total</b>	<b>914</b>	<b>100%</b>	<b>16,203,465</b>	<b>100%</b>	<b>9,068,861</b>	<b>100%</b>

\* Small park building

Source: PLUTO 2012

**Figure 1.1 Land Uses by Percent Total Lot Area in Red Hook [top]**

**Figure 1.2 Land Uses by Percent Total Lot Area in Red Hook [bottom]**



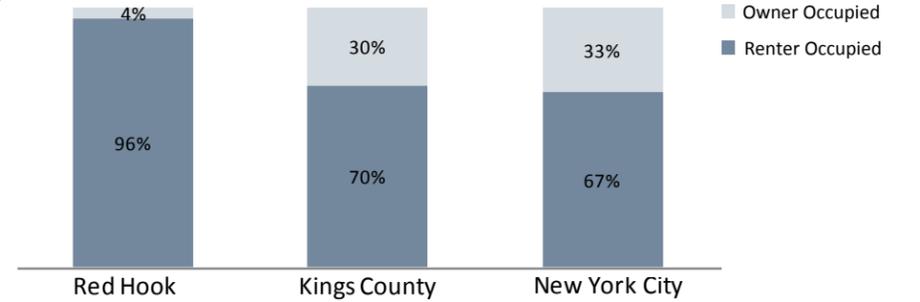
Source: PLUTO 2012

## Housing

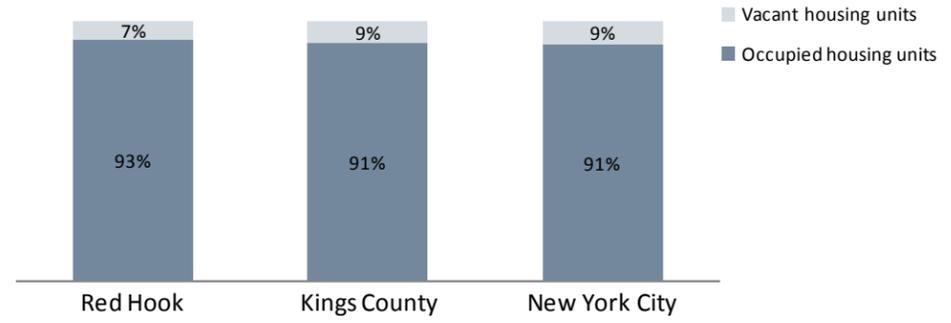
The percentage of home ownership is significantly lower in Red Hook than in the rest of the borough and New York City as a whole. In this community, only 4 percent of residents live in homes that they own, while in Brooklyn, 30 percent of homes are owner-occupied. Low rates of home ownership in Red Hook may be attributed to the presence of the NYCHA Red Hook Houses development, a publicly subsidized rental community. Together, Red Hook Houses East and Red Hook Houses West make up nearly all housing units in census tract 85- a portion of the Study Area where there is a relatively dense residential population. Combined, these developments house 6,518 people in 2,873 units in 30 buildings. Residents of Red Hook Houses account for 57 percent of the total population of Red Hook and 82 percent of the population of census tract 85. The housing unit vacancy rate in Red Hook (7 percent) remains only slightly lower than the vacancy rate for New York City as a whole and Brooklyn.

While the above analysis was done for the entire Red Hook neighborhood, there are 799 housing units in the Study Area based on the City's Primary Land Use Tax Lot Output data (PLUTO).

**Figure 1.3 Housing Occupancy**  
Source: ACS 2007 - 2011



**Figure 1.4 Housing Tenure**  
Source: ACS 2007 - 2011



# INFRASTRUCTURE

## Transportation

Red Hook is not particularly well served by public transportation. It takes about 50 minutes to travel from Red Hook to mid-town Manhattan by public transportation and approximately 30 minutes by car. Red Hook remains isolated from the rest of Brooklyn and New York City by infrastructure and location. Many residents use the bus and have expressed a desire for better mass transit connections.

**Highways** The area is connected to the broader region mainly by highway networks. Automotive connections to the rest of New York City and the region stem from the proximity of the Gowanus Expressway (I-278) which offers connections to lower Manhattan by way of the Brooklyn Battery / Hugh L. Carey Tunnel (I-478) to the west as well as the Prospect Expressway/ Ocean Parkway to the east. Connection is also available to the Brooklyn – Queens Expressway (I-278) which extends from Red Hook, Brooklyn to Astoria, Queens. These roadways are displayed in Map 1.5. While these highways provide regional connections, they also impede local access to neighboring areas and transit nodes, such as the Smith/9th Street Subway Station.

**Truck Routes** The area is served by several local and through truck routes. The NYC DOT defines a local truck route network as “designated for trucks with an origin and destination within a borough. This includes trucks that are traveling to make a delivery, or for loading or servicing. Trucks should only use non-designated routes at the beginning or end of a trip, when traveling between their origin/destination and a truck route.” Local routes include those that run north-south along Van Brunt, Court, and Smith Street, and east-west along Bay, Halleck, Delevan, and Nelson Streets and Hamilton Avenue. There are also two through truck routes that run along the Gowanus and Brooklyn-Queens Expressways. The Through Truck Route Network is “primarily composed of major urban arterials and highways and must be used by trucks that have neither an origin nor destination within the borough.”

**Bus Service** As displayed in Map 1.11, this portion of southwest Brooklyn is served by the B61 and B57 New York City buses, operated by MTA New York City Transit. These buses offer connections to other parts of the borough and the city; the B57 (Flushing Ave/Court/Smith Sts) operates between Fresh Pond Road, Flushing Avenue, Queens, and IKEA Terminal while the B61 (Van Brunt St/Atlantic Ave/9th St) offers service between Smith/Livingston Sts and 20th Street/Prospect Park West.

**Subway Service** There are no subway stations in the Study Area. The closest subways are the F and G train lines (running underneath Smith Street until Carroll Street, after which are elevated above ground), and the 4th Avenue R Subway Line following a route along 9th Street after turning off Smith Street. The Smith/9th Street, Carroll Street, 4th Avenue/9th Street, and Prospect Avenue subway stations are the closest to the Study Area (Map 1.11). However, the Gowanus Expressway inhibits access between Red Hook and these modes of public transit and in many ways isolates Red Hook. This major roadway presents difficult pedestrian crossings across Hamilton Avenue (located underneath the expressway) due to its width and heavy traffic flow.

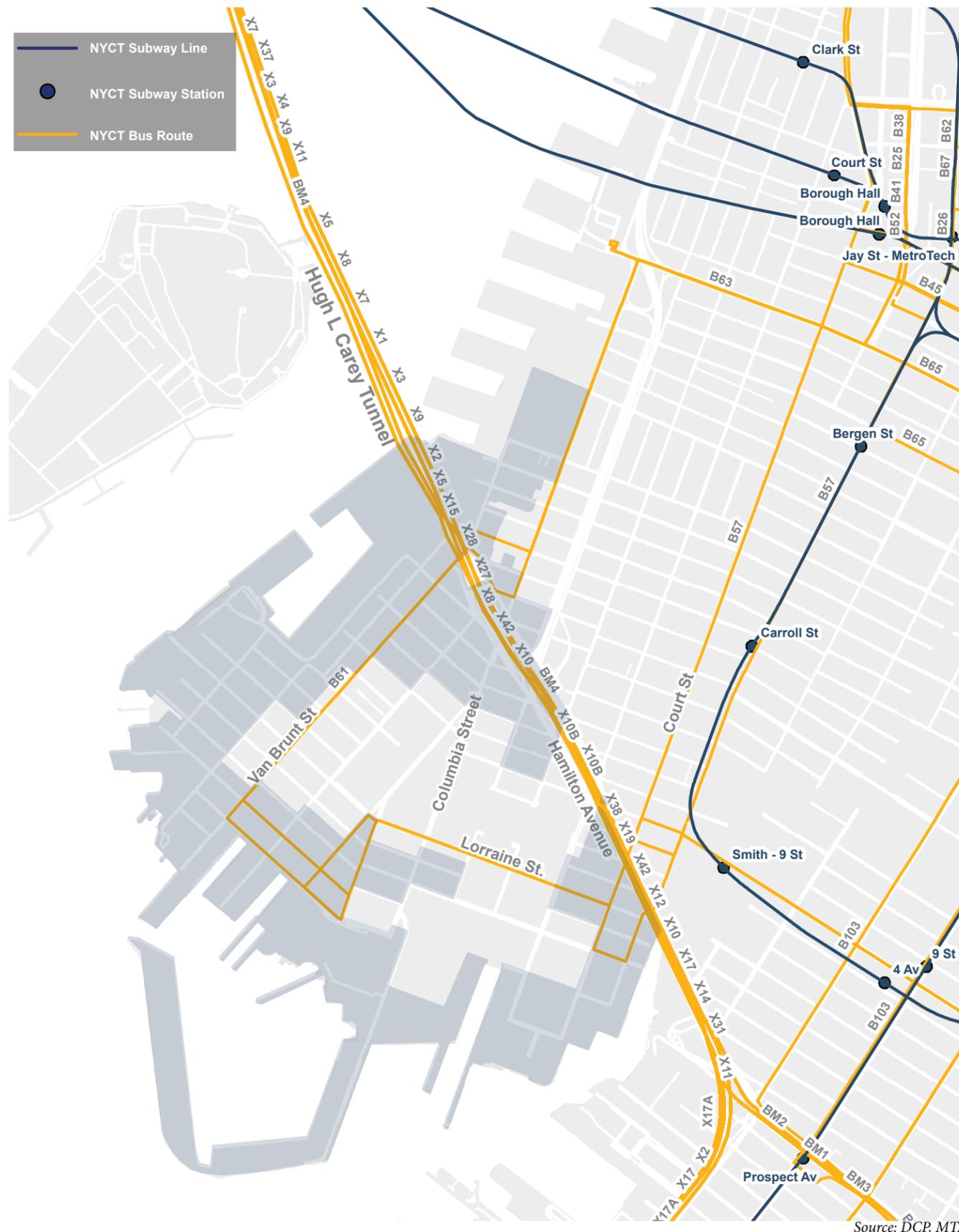
**Bike Lanes** As shown below in Map 1.10, the growing network of bike infrastructure also serves transportation connections in and around Red Hook. One important development that will impact connectivity between Red Hook and the rest of the borough of Brooklyn is the Brooklyn Waterfront Greenway, a planned 14 mile route from Greenpoint through Sunset Park. To date, 5 miles have been constructed and are in use including Kent Avenue in Williamsburg, and Columbia Street in and north of Red Hook. Mapped below in dotted lines, the Greenway will be a combination of bicycle lanes protected and bicycle paths.

**Ferry Service** Ferry service is operated by the New York City Water Taxi and provides service between Pier 11 in Manhattan with a stop at IKEA. Over the summer, ferry service was expanded to include a stop at the terminus of Van Brunt Street on the weekends. There is ongoing research into increased ferry service to Red Hook.

Map 1.10 Public Transportation Network



Map 1.11 Public Transportation Network



Source: DCP, MTA

## Sewer and Power

The proposed BOA is served by New York City's sewer system. Red Hook and the north-west section of Brooklyn and Governor's Island have been serviced by the Red Hook Wastewater Treatment Plant located in the Brooklyn Navy Yard since 1987. This plant serves a 3,200 acre drainage area and 192,050 people.<sup>ix</sup> There are several Combined Sewer Outfalls (CSOs) along the waterfront that empty into local waterways around Red Hook. These outfalls include four along the Atlantic Basin, and 12 along the Gowanus Canal, in addition to CSOs at the termini of Wolcott, Van Brunt, Columbia, Creamer, and Sackett Streets. According to the United State EPA, "Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water bodies." The presence of CSOs near Red Hook indicates environmental contamination in Red Hook's surrounding water bodies. This issue is complicated by the risk of flooding in Red Hook and other low-lying coastal areas, as flood waters can carry dangerous raw sewage.

Electricity within the Study Area is delivered by Con Edison. Unlike the majority of Brooklyn which has an underground distribution system, the power supply for most of Red Hook's residential areas is distributed by way of an overhead power lines. Along the waterfront, however, the power is distributed through underground networks that are typically more reliable, as they support the power system from multiple power sources. However, they are vulnerable to flooding.

## Parks and Open Spaces

There are two significant parks and recreation areas in Red Hook: the Red Hook Recreational Area (where the Red Hook pool is located) and Coffey Park located at Verona Street between Richard and Dwight Streets. In addition, there are three small waterfront parks and open spaces including the Erie Basin Park, the Pier 44 Waterfront Garden, and Louis Valentino Jr. Park.

Several significant parks serve Red Hook but were excluded from the Study Area. The Red Hook Recreation Area, designated as New York City park land, is a 58.5 acre public space which includes the Red Hook Recreational Center, Red Hook Pool, and Red Hook Park with athletic playing fields and passive park spaces. The City acquired the first piece of land for what is now Red Hook Park on October 10, 1913, originally to provide terminal facilities for the marginal freight railroad. The property was not assigned to the New York City Department of Parks and Recreation until June 27, 1934. The other parcels came under Parks' jurisdiction between 1935 and 1947. Under Parks Commissioner Robert Moses, Gilmore Clarke, one of America's most prominent landscape designers at the time, laid out the original development plan for the Recreational Center.<sup>x</sup>

Other significant parks in the area include Coffey Park and Louis J Valentino Jr. Park. Pier 44 Waterfront Garden (the site of the Waterfront Museum) and the Erie Basin Park are recent and significant open spaces in the neighborhood that have been privately developed for public use by The O'Connell Organization and IKEA respectively.

As illustrated in MAP 1.12, the presence of street trees in the Study Area is slim, especially when compared with the more residential neighborhoods north of the Gowanus Expressway. This is a reflection of entrenched nature of industrial uses in Red Hook. It also reflects an overall lack of new development in the area and the relative old-age of buildings.

Map 1.12 Parks, Open Spaces, and Street Trees

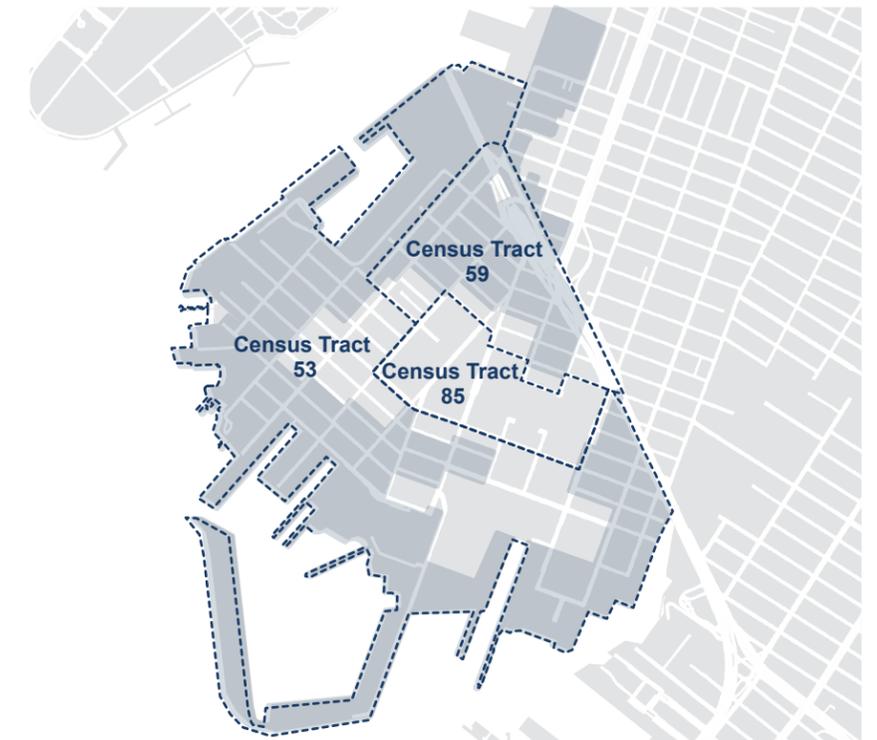




# DEMOGRAPHIC AND ECONOMIC PROFILE

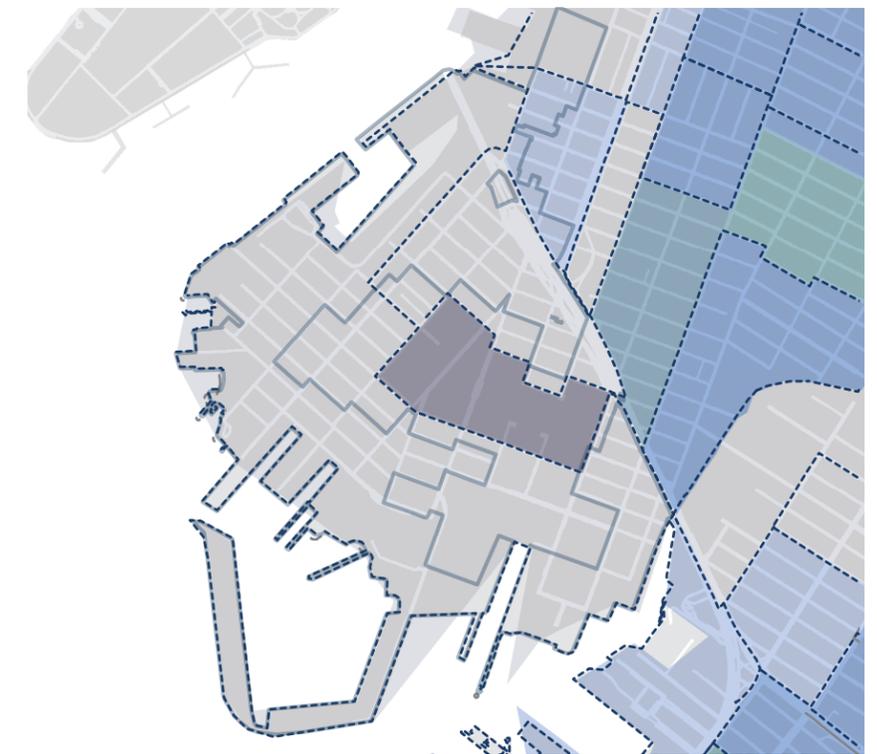
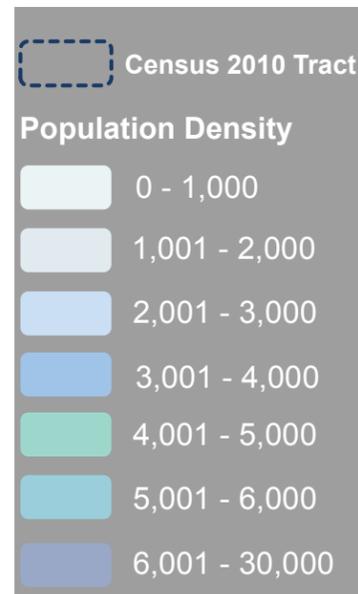
*Data from several surrounding census tracts (tracts 53, 59, and 85) have been drawn to provide more accurate, contextualized information about the demographic profile of the BOA Study Area and the surrounding residential community. The data discussed in the following section are primarily drawn from the American Community Survey (ACS) and 2010 Census. The area targeted for demographic analysis is referred to as Red Hook in this section.*

Map 2.1 Demographic Study Area



Source: DCP, US Census

Map 2.2 Population Density



Source: DCP, US Census

# DEMOGRAPHICS: SOCIAL CHARACTERISTICS

## Population

Strictly speaking, the Study Area contains few residents (roughly 1,400 people). As of the 2010 Census, Red Hook has a total population of 10,228 people. This reflects only a .1 percent increase (13 people) from the Census 2000 count. However, there have been significant gains among White Nonhispanic and Asian Nonhispanic populations, 126.6 percent and 272.7 percent respectively. The most significant loss occurred among Nonhispanic of two or more races and Black/African American populations, 33 percent and 14.7 percent respectively.

## Race

As of the 2010 Census, a significant portion (43 percent) of the Red Hook is self-identified as Hispanic. There is also a strong presence of Black/African American residents, over 36 percent.

Compared with the rest of New York City, this neighborhood has a significantly higher proportion of people of Hispanic origin and Black/African American Nonhispanic people. There are also significantly lower White and Asian populations in Red Hook compared with the rest of New York City- 17 percent and 2 percent respectively. This analysis is displayed in Table 2.1.

**Table 2.1 Racial Demographics**

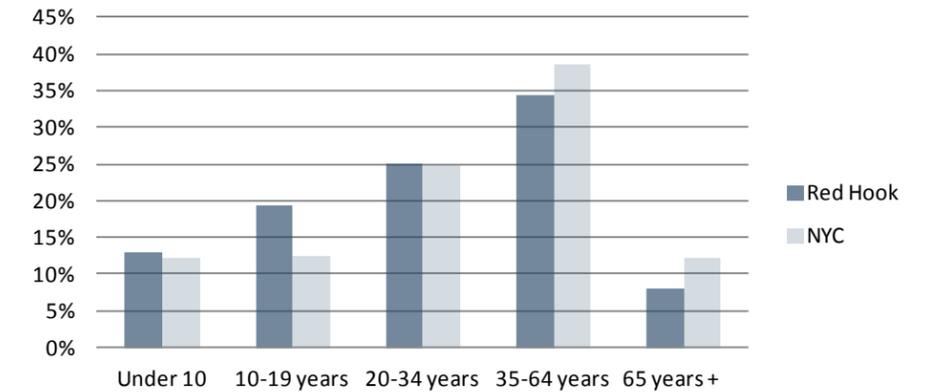
	Red Hook		New York City	
	Number	Percent	Number	Percent
White Nonhispanic	1,740	17.0%	2,722,904	33.3%
Black/African American Nonhispanic	3,703	36.2%	1,861,295	22.8%
Asian Nonhispanic	205	2.0%	1,030,914	12.6%
American Indian/Alaskan Nonhispanic	36	0.4%	17,427	0.2%
Some other race Nonhispanic	29	0.3%	57,841	0.7%
Nonhispanic of two or more races	140	1.4%	148,676	1.8%
Hispanic	4,371	42.7%	2,336,076	28.6%
<b>Total Population</b>	<b>10,228</b>	<b>100.0%</b>	<b>8,175,133</b>	<b>100.0%</b>

## Age

Based on ACS 2007-2011 5 Year estimate, the age distribution among residents of the Red Hook community skews slightly younger than that of New York City. There is a higher share of children in the community, especially teenagers in the 10-19 age range. Compared with the rest of New York City, Red Hook has a lower percentage of adults over 35; however, adults between 35 and 64 years old are the largest cohort group. There are generally more females than males. Combined, children and young adults between the ages of 5 and 24 account for over 37 percent of the total population in Red Hook.

**Figure 2.2 Residential Age Distribution**

Source: ACS 2007 - 2011

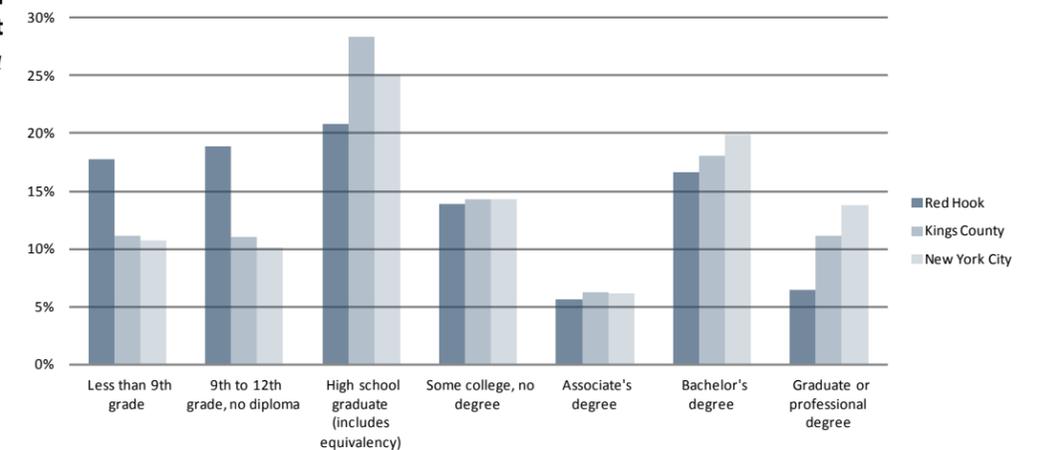


## Educational Attainment

Based on ACS 2007-2011 5 Year estimate, Red Hook has a higher percentage of people who have not completed high school education compared with the rest of the borough and New York City: 18 percent of adults 25 and older have completed less than 9th grade, and 19 percent have completed some of high school without receiving a diploma. People in Red Hook demonstrate lower educational attainment across all educational levels.

**Figure 2.3 Educational Attainment**

Source: ACS 2007 - 2011



## DEMOGRAPHICS: ECONOMIC CHARACTERISTICS

**Poverty** Nearly 40 percent of residents live below the poverty level- almost double the poverty rate of Brooklyn and New York City as a whole.

**Income** In Red Hook, the average median household income is \$49,396. This is lower than the rest of New York City where the median household income is \$51,270.

**Table 2.2 Economic Characteristics**

Source: ACS 2007 - 2011

Economic Characteristic	Red Hook	Brooklyn	NYC
<b>Poverty</b>			
Percentage of families and people whose income in the past 12 month is below the poverty level	39.1%	22.10%	19.40%
<b>Income</b>			
Median Household Income (Dollars)	\$49,396	\$44,593	\$51,270

## INDUSTRIES AND EMPLOYMENT

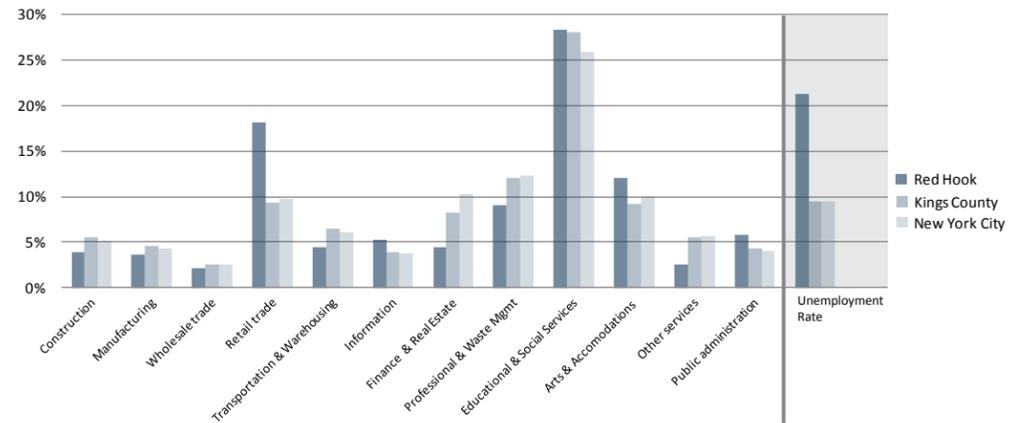
**Employment by Industry** Based on ACS 2007-2011 5 Year estimate, among those employed, a significantly greater share of workers living in Red Hook work in the retail sector (18 percent) than workers employed in this sector across the borough and New York City (9 and 10 percent respectively). There is also a higher percentage of workers employed by the information industry, which may be attributed to the presence of technology start-up companies that have recently located to the area. Conversely, there are significantly lower percentages of workers employed by the finance and professional industries (4 percent and 9 percent respectively).

While 14 percent of the population is employed by industries common in Manufacturing Districts such as construction, manufacturing wholesale trade, transportation, and warehousing industries, residents in Red Hook may not be employed by these firms located in their own community.

At 21 percent, the unemployment rate in Red Hook is significantly higher than that of Brooklyn (9.5 percent) and New York City (9.5 percent) according to the 2007-2011 ACS. The unemployment rate is defined by the Census as "all civilians 16 years or older who were neither 'at work' nor 'with a job but not at work' during the reference week, were looking for work during the last 4 weeks, and were available to start a job."

**Figure 2.4 Employment by Industry and Unemployment**

Source: ACS 2007 - 2011



## Jobs and Firms

Analysis of the industry mix and employment conditions was conducted using the Quarterly Census of Employment and Wages (QCEW) administered by the United States Department of Labor, Bureau of Labor Statistics. This program publishes a quarterly count of employment and wages reported by employers covering 98 percent of U.S. jobs.

Analysis of this data helps to identify the potential for new business and land use development. To understand commercial and industrial development potential in Red Hook, the BOA Study Area was drawn to capture the industries in the area. This analysis was done based on only private firms. It captures private companies on privately- or city-owned land, but does not include public employees, regardless of site ownership. The following analysis was done with the data supplied for the third-quarter of years 2000 and 2011.

The data relevant to Red Hook demonstrates a modest overall increase in jobs and number of firms between 2000 and 2011. Based on the number of private firms and employees, the most prevalent industries include construction, wholesale trade, transportation and warehousing, and manufacturing companies. Of the total 5,439 employees captured in this analysis, the majority are employed by the transportation and warehousing industry including companies that perform services such as freight trucking, automotive and bus services, maritime transportation, refrigerated warehousing, and marine cargo handling. The manufacturing sector in Red Hook includes electrical and component manufacturing, breweries, commercial printing and screen printing, linen mills, custom architectural woodwork, fruit and vegetable canning, glass product manufacturing, pharmaceutical preparation, seafood product preparation and packaging, sign manufacturing, spice and extract manufacturing, and custom household and architectural carpentry.

Table 2.3 demonstrates the change in number of firms, wages, and employees by industry between 2000 and 2011. It appears that there is an overall increase in total firms and employees in Red Hook, 37 and 35 percent respectively. This analysis highlights the interest that a wide variety of firms and industries have in making Red Hook their place of business. Notably, the rate of change with which employment increased in industries such as accommodation and food services, real estate and rental leasing, retail, and other services (including businesses such as barber shops, civic and social organizations, and some auto services) indicate a rapid upward trajectory for these types of businesses. Losses were recorded in the manufacturing and wholesale trade industries. The only industry that appears to be losing firms is the wholesale trade industry, which includes wholesale trade of grocery and food items, jewelry, electronics, sporting goods, construction and electrical equipment, and automotive parts. Loss of employment occurred in the manufacturing and wholesale industries (37 and 8 percent respectively) between 2000 and 2011.

In Table 2.3 and Figures 2.5 and 2.6, the industry labeled "All Other" encompasses educational services, finance and insurance, information, management of companies and enterprises, professional, scientific, and technical services, utilities, and arts, entertainment and recreation industries. These had firms and/or employee counts too low to disclose at an industry-specific level. Still, data demonstrate that these industries represent significant opportunities for economic growth in Red Hook: each of these industries grew in number of firms. Within the arts, entertainment, and recreation industry, the majority of firms and employees include those that are independent artists, writers, and performers.

DEMOGRAPHIC AND ECONOMIC PROFILE

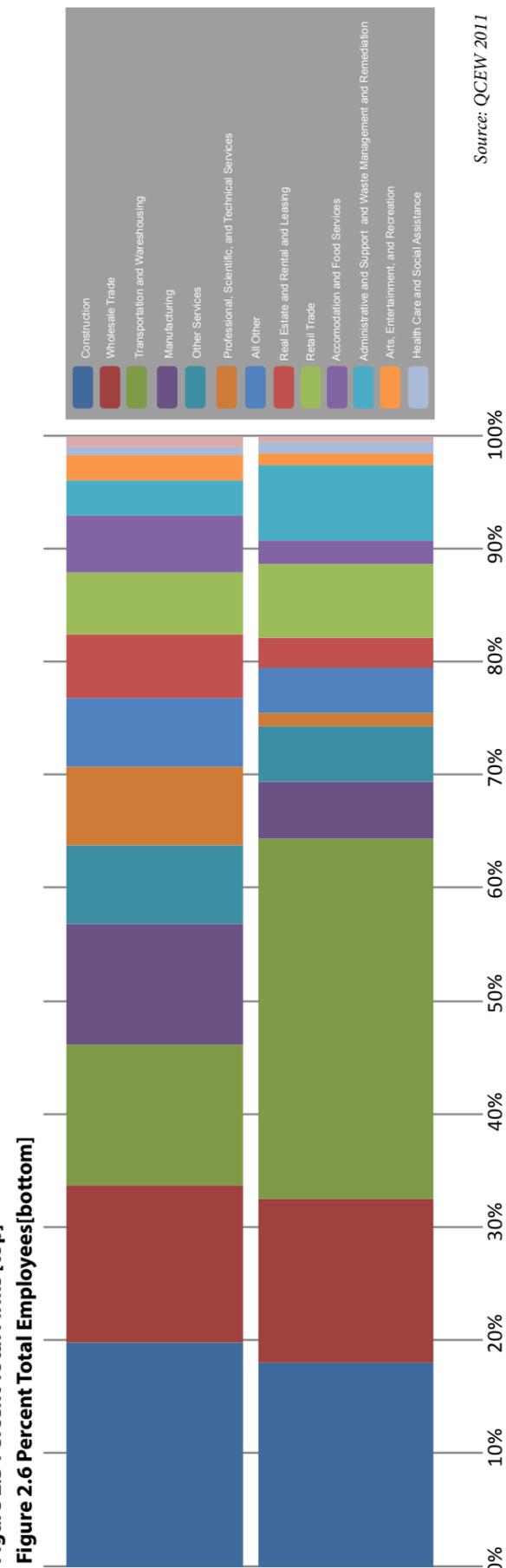
**Table 2.3 Employment and Firms, 2000 - 2011**

Industry	2000		2011		Percent Change	
	Firms	Employees	Firms	Employees	Firms	Employees
Accommodation and Food Services	6	20	20	18	200%	435%
Administrative and Support and Waste Management and Remediation Services	9	160	160	11	22%	129%
Construction	67	957	957	71	6%	3%
Health Care and Social Assistance	3	53	53	3	0%	4%
Manufacturing	37	431	431	38	3%	(-37%)
Other Services (except Public Administration)	17	75	75	25	47%	257%
Real Estate and Rental and Leasing	9	30	30	20	122%	383%
Retail Trade	10	70	70	20	100%	416%
Transportation and Warehousing	31	1,190	1,190	45	45%	45%
Wholesale Trade	56	861	861	50	(-11%)	(-8%)
All Other	17	172	172	58	241%	110%
<b>Grand Total</b>	<b>262</b>	<b>4,019</b>	<b>359</b>	<b>5,439</b>	<b>37%</b>	<b>35%</b>

Source: QCEW 2000, QCEW 2011

GEOGRAPHY AND LAND USE

**Figure 2.5 Percent Total Firms [top]**



**Figure 2.6 Percent Total Employees [bottom]**



## RECENT PUBLIC INITIATIVES AND PRIVATE INVESTMENTS

While the BOA Study Area in Red Hook has long been used for manufacturing and industrial uses, there are indications that the neighborhood has begun to shift towards a wider variety of uses. There are also signs of a heightened interest in development in the area. These developments include but are not limited to the introductions of the Fairway Supermarket, an important anchor for neighborhood retail businesses; IKEA home furnishings, a regional destination made more accessible through the opening of ferry service between downtown Manhattan and Red Hook; and increased public access to the waterfront along the Columbia Street Esplanade and Erie Basin Park established as a part of the IKEA development. There has also been expressed interest for redevelopment of the Revere Sugar Refinery site and the Red Hook Grain Terminal site by Joe Sitt and John Quadrozzi respectively. The existing conditions and environmental history of each site is explored in subsequent sections of this document.

Another important development in the area includes the Superfund designation by the United States EPA of the Gowanus Canal and its ongoing planning for cleanup. The Gowanus Canal, a narrow body of water that runs between Red Hook and the Gowanus neighborhood of Brooklyn, has been heavily polluted by nearly a century of industrial activity along its shore. These activities include, but are not limited to, coal processing in manufactured gas plants (MGPs), the operations of mills, tanneries, and chemical plants, as well as dumping of industrial waste into the canal. According to the US EPA, sewer outflows and storm runoff also contribute to the contamination of the canal. Overall, EPA concludes "the contamination poses a threat to the nearby residents who use the canal for fishing and recreation." The EPA anticipates that it will begin the design phase of the remedy in the spring of 2014. Design of the remedy is expected to take three years and dredging and capping is anticipated to take approximately six years. Several sites bordering the canal have also been targeted for environmental clean-up and study. The contamination of the canal may indicate potential contamination of upland parcels along the canal. In turn, any future development of these upland sites, including the portion of Red Hook that abuts the canal, may be complicated by contamination.



*IKEA Home Furnishings, Red Hook*



**PART TWO**

*ENVIRONMENTAL CONDITIONS*

*STRATEGIC SITES*

*FLOOD RISK AND RESILIENCY*

## Government Databases and Regulatory Programs

### **United States Toxic Release Inventory**

The US EPA also oversees the Toxic Release Inventory Program (TRI). TRI tracks the management of certain toxic chemicals that may pose a threat to human health. U.S. facilities in different industry sectors must report annually how much of each chemical is released to the environment and/or managed through recycling, energy recovery and treatment.

### **New York State Bulk Storage Program**

Tanks storing petroleum and hazardous chemicals must meet minimum standards established by the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (DEC). New York's Hazardous Substances Bulk Storage Program (including Petroleum Bulk Storage and Chemical Bulk Storage programs) provides guidelines and controls for the storage of many different hazardous chemicals including petroleum products.

#### **Petroleum Bulk Storage (PBS)**

The NYS Petroleum Bulk storage Program regulates tanks at facilities with a cumulative storage capacity of more than 1,1000 gallons

#### **Chemical Bulk Storage (CBS)**

The NYS CBS program regulates aboveground storage tanks with a capacity of 185 gallons or more, all underground storage tanks regardless of capacity, and all non-stationary tanks.

### **New York State Spill Incidents Database**

A "spill" is an accidental or intentional release of petroleum or other hazardous materials. The database records spill incidents, including such information as material spilled, resource affected, amount spilled in gallons or pounds, and the name of water body affected by spill.

### **New York State Major Oil Storage Facility (MOSF)**

The MOSF program regulates tanks and vessels at petroleum storage facilities with a cumulative capacity of 400,000 gallons or more.

### **New York State Resource Conservation and Recovery Act Facilities (RCRA)**

The Resource Conservation and Recovery Act Program addresses adverse impacts to human health and the environment that are discovered as a result of unsafe waste handling and disposal practices.

### **New York State Solid Waste Facilities**

Solid waste facilities are sites listed on NYSDEC solid waste database and may include landfills or solid waste transfer stations.

### **New York City Vacant Property Database**

Vacant Properties (VP) are vacant, privately-owned properties. 3,150 vacant privately owned commercial and manufacturing properties were evaluated in 2009 to establish general site histories and this information is publicly available on SPEED (Searchable Property Environmental Electronic Database; [www/nyc.gov/speed](http://www/nyc.gov/speed)). Vacancy status, signifying the lack of structure or use on site, is determined by NYC Department of Finance assessment.

### **New York City E-Designation**

Changes in zoning are subject to an environmental review pursuant to state and local law. An (E) designation is a zoning map designation that provides notice of the presence of an environmental assessment requirement pertaining to potential hazardous materials contamination, noise or air quality impacts on a particular tax lot where new construction or land use change is planned.

The following resources and records were the primary sources involved in the compilation and evaluation of strategic sites.

## Data Sources

The following list is a compilation of governmental databases and regulatory programs that are associated with the management of hazardous materials. These records are publicly accessible, and indicate potential contamination in a given area and help communities maintain awareness of environmental issues in their neighborhood. In addition to Sanborn Fire Insurance maps and records kept by the New York City Department of Buildings, the following resources also contribute to the site histories found in the Strategic Site profiles.

## *Historic Resources*

### **Sanborn Fire Insurance Maps**

*These maps, produced by the Sanborn Map Company since 1867, include information about built structures such as building footprint, construction materials, and use of structures. The maps identify materials known to be fire accelerants, and show all pipelines, railroads, wells, dumps, and heavy machinery in an area.*

### **NYC Department of Buildings**

*The Department of Buildings maintains records of all construction activity, job filings, violations, complaints and certificates of occupancy for a particular address.*

## INTRODUCTION

### *Geologic Conditions*

The presence of historic fill in Red Hook is pervasive. As described previously in this report, the Red Hook peninsula was once a marshy wetland with clay-like soil. In order to enable industry and business activity along the waterfront, the marshes and open-water was reclaimed and filled. This practice transformed Red Hook, and much of New York City's waterfront, from invaluable marsh-land to areas suitable for industry and shipping activities that relied on New York Harbor. Generally, these fill materials may be comprised of a variety of materials and contaminants including building demolition material, dredging spoils, and byproducts of industrial activities such as slag and foundry sand. Areas of historic fill are often contaminated with polycyclic aromatic hydrocarbons (PAHs), heavy metals such as lead, and petroleum products. Given the nature of filling activities, contamination is not contained within property lines and results in area-wide environmental impairment. This contamination has the potential to affect groundwater resources. However, groundwater in this coastal area is not used for potable water supply. Although historical fill is usually only lightly or moderately contaminated, it does require environmental management and tends to complicate new development.

Along the coastal waterfront, filling activities enabled industrial operations on newly created land. These industries were largely unregulated until the end of the 20th century and often resulted in additional land pollution.

## ENVIRONMENTAL CONDITIONS

*This section explores the geologic and historic setting that informs the environmental conditions of Red Hook. The BOA program aims to enhance a community's understanding of its environment and empower residents to make more informed decisions about the future of their neighborhood. Part of that process includes the identification of historic and current contamination issues, as well as the selection of strategic sites which may ultimately be remediated and redeveloped. The following section will provide an overview of geologic conditions in Red Hook that may contribute to contamination, discuss historic resources and available data for the area, and provide a synopsis of local environmental trends. It will conclude with strategic site profiles that encompass current and historic land uses and address any evidence of noxious or hazardous materials on site.*

# ENVIRONMENTAL TRENDS AND REMEDIATION ACTIONS

Analysis of historic maps, building records, as well as the environmental databases discussed above reveals that Red Hook's history is rooted in manufacturing and industrial uses. These activities have ranged from maritime industrial services, manufacture of goods, manufacture of chemical products, coal and petroleum storage and processing, automotive uses, and junk storage.

The use and storage of petroleum and other hazardous materials is common in industrial areas. Improper handling and storage of petroleum and hazardous chemicals can result in leaks and spills, and thus poses a threat to environmental quality and health. These risks include fire or explosion, noxious odors and/or fumes, and potential soil and groundwater contamination. Analysis of the environmental databases and programs listed above show that bulk storage, spills, and vacant fill properties are pervasive in Red Hook. Considering the entire peninsula (all properties south of Hamilton Avenue), there have been 21 Spill Incidents. In this same area, there are 45 Petroleum Bulk Storage registrations. Further, there are two sites of Chemical Bulk Storage registered by the Witco Corporation Polymer Additives Group at 700 Court Street and by Hess Corporation at 722 Court Street.

There are two Resources Conservation and Recovery Act (RCRA) Facilities: Witco Corporation Brooklyn Plant and Karbo Bronze Foundries Incorporated. There is one NYS Solid Waste Facility, IESI Progressive Waste Solutions, located at 577 Court Street. Lastly, the Hess Terminal, located on Bryant Street, is a NYS Major Oil Storage Facility.

In Red Hook, there are a total of 66 sites listed in the VPD There are also 6 (E)-Designations that were the outcome of the change in zoning (from M3-1 to MX-5) that took place in 2002. These (E)-Designations are all related to Hazardous Materials and are located along Van Brunt Street between Beard and Coffey Street.

Several sites, both within the Study Area and proximate to Red Hook, have undergone or are presently undergoing remediation through the New York State Brownfields Cleanup and New York State and United States Superfund programs. There are two sites in Red Hook that report to the Toxic Release Inventory (TRI): Ameranda Hess Corporation Brooklyn Terminal (also known as the Hess Terminal) and Eastern Concrete Materials Red Hook Plant.

The summary tables (Tables 4.1 and 4.2) found in this section outline these sites. They highlight the types of contaminants that are present in Red Hook and the surrounding area and are organized by Federal and State programs. Where information was readily available, historic uses and pollutants are also listed. It also provides an overview of site-specific study that has already taken place.

## Brownfields Cleanup Program

New York State, through the New York State Department of Environmental Conservation (NYS DEC), oversees the New York State Brownfields Cleanup Program and the New York State Superfund Program (also known as the Inactive Hazardous Waste Disposal Site Remedial Program). The goal of the Brownfield Cleanup Program (BCP) is to enhance private-sector cleanups of brownfields. A taxpayer who has entered into a Brownfield Cleanup Agreement (BCA) with DEC may be eligible for tax credits relating to the cleanup and redevelopment of a brownfield site. The Inactive Hazardous Waste Disposal Site (IHWDS) Program is the State's program for identifying, investigating and cleaning up sites where consequential amounts of hazardous waste may exist. These sites go through a process of investigation, evaluation, cleanup and monitoring that has several distinct stages.

Four sites in the area have undergone investigation and/or cleanup through the State's Brownfield Cleanup Program: U.S. Dredging Shipyard (presently the site of IKEA), the current site of Whole Foods, Gowanus Village, and Citizens Manufactured Gas Plant (MGP). Three sites, each bordering the Gowanus Canal, are registered in the State Superfund Program. Each is classified as Classification Code 2; sites that receive a classification of 2 (representing a significant threat to public health and/or the environment and requiring action) usually undergo a detailed environmental investigation, called a remedial investigation. When the parties responsible for the contamination are known, the responsible parties often pay for and perform the investigation and evaluation of cleanup options. At class 2 sites where responsible parties cannot be found or are unable or unwilling to fund an investigation, the State pays for the investigation using money from the 1986 Environmental Quality Bond Act, also known as the "State Superfund." The State is then required to pursue recovery of costs from a responsible party after the investigation and cleanup are complete.

**Table 4.1 State Funded Remediation**

New York State Department of Environmental Conservation			
Brownfields Cleanup Program			
Site Name	Historic Use(s)	Remedial Status	Known Contaminants
U.S. Dredging Shipyard Site, IKEA	Ship repair	Remediation Complete	Acetone, Arsenic, Lead, Mercury, Methylene Chloride, Naphthalene, PCBs, Benz(A)Anthracene, Benzo(B)Flouranthene, Benzo(K) Flouranthene Copper
Whole Foods Site	Coal Yard, Petroleum Processing, junkyard	Remediation Complete	Acenaphthene, Benzene, Benzo(A)Pyrene, Cadmium, Lead, Mercury, Naphthalene, Phenol, Xylene
Gowanus Village	Sulfur works, Power station	Underway / Incomplete	PCBs, SVOCs, VOCs, Perchloroethene, Copper, Arsenic, Barium
Citizens MGP	Manufactured Gas Plant	Underway / Incomplete	Coal Tar
State Superfund Program			
Site Name	Historic Use(s)	Remedial Status	Known Contaminants
Metropolitan MGP	Manufactured Gas Plant	Class 2: Remedial investigation underway	Benzene, Benzo(A)Pyrene, Coal Tar, Naphthalene, Toluene
Chemtura 688-700 Court Street	Wastewater pre-treatment, iron works, manufacture of iron paper, lumber yard, boiler production, marine canvas supply	Class 2 : Remedial investigation complete	Acetone, Benzene, Naphthalene, Phenol, PCB, Toluene, Xylene
Chemtura 633 Court Street	Tar paper manufacturing, production of metallic-organic soaps and salts, production of aluminum paste	Class 2 : Remedial investigation complete	Acenaphthene, Acentone, Anthracene, Arsenic, Barium, Bensene, Benzo(A)Pyrene, Benzo(B)Flouranthene, Cadmium, Chrysene, Ethylbenzene, Lead, Mercury, Naphthalene, Phenanthrene, Phenol, PCB, Pyrene, Toluene, Vinyl Chloride, Xylene

### Superfund

The United States Environmental Protection Agency (US EPA) oversees both the National Priorities List and Superfund Programs. The National Priorities List (NPL) is the list of national priorities sites with known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. Superfund, as it is commonly known, is the federal government’s program to regulate clean up of sites identified on the NPL. The Gowanus Canal, adjacent to Red Hook, and Brookhatten Smelting and Refining have both been identified by the US EPA for testing and/or remediation. Brookhatten has been targeted for soil testing and removal by the US EPA which was scheduled to take place in May and June of 2013. Further, contamination of the Gowanus Canal, presently undergoing remediation through the federal Superfund program, underscores a long history of heavy industrial uses common throughout the area.

**Table 4.2 Federally Funded Remediation**

United States Environmental Protection Agency National Priority List, Superfund		
Site Name	Historic Use and Contaminants	
Gowanus Canal	Industrial discharges and pollutants, storm water runoff, sewer outflows, PCBs, coal tar waste, heavy metals, volatile organic compounds	

Toxic Release Inventory Program		
Site Name	Use	Controlled Pollutants
Ameranda Hess Corporation Brooklyn Terminal (722 Court Street)	Petroleum Bulk Station and Terminal	Trimethylbenzene, Lead, N-Hexane, Naphthalene, Toluene, Polycyclic aromatic compounds, Benzo Perylene
Eastern Concrete Materials Red Hook Plant (640 Columbia Street)	Ready-Mix Concrete Manufacturing	Nitrate Compounds

## STRATEGIC SITES

The following includes an inventory of sites that may be suitable for selection as strategic sites by SWBIDC during the community brownfield planning process. Sites selected as strategic sites by community planners often meet the following criteria:

- **The parcel is vacant or underutilized and is a feasible site for redevelopment**
- **The parcel may have a history of usage that could have resulted in environmental contamination**
- **The parcel has characteristics that lend themselves to the progress of community visions and development goals**

The following site profiles are intended to provide a basis for strategic site selection by SBIDC and other CBO’s during the community planning process in the Study Area. The selected sites are a diverse set of properties that are the product of a preliminary site selection process. Each profile provides an in depth historical description of current and historic land uses and highlights any evidence of industrial activity or use of hazardous materials on site. This helps community members, investors and developers to understand the extent of a potential contamination issue– the first step in remediation, revitalization and redevelopment efforts.

Fourteen potential strategic sites have been identified for the purposes of this existing conditions study. The following table (Table 4.3) and map (Map 4.1) summarize their characteristics and locations within the study area. Fourteen strategic sites have been identified for the purposes of this existing conditions study. The following table (Table 4.3) and map (Map 4.1) summarize their characteristics and locations within the study area.

Map 4.1 Strategic Sites



Table 4.3 Strategic Site Summary Table

Strategic Site	Name	Site Area (sqft)	Site Area (acres)
1	REVERE SUGAR	666,600	15.3
2	ERIE BASIN COAL YARD	94,000	2.16
3	COLUMBIA STREET	176,041	4.04
4	THE RED HOOK GRAIN TERMINAL	572,885	13
5	COFFEY AND OTSEGO	36,705	.84
6	CHESEBROUGH SITE	146,740	3.37
7	NEW YORK DOCK COMPANY	141,144	3.24
8A	LUQUER STREET	13,250	.31
8B	NELSON STREET	10,175	.23
9	SMITH STREET	129,150	2.96
10	BROOKLYN CLAY RETORT	20,275	.47
11	VAN BRUNT AND COFFEY	23,350	.54
12	DIKEMAN AND CONOVER	10,000	.23
13	KARBO BRONZE	7,500	.17
<b>TOTAL AREA OF STRATEGIC SITES</b>		<b>2,047,815</b>	<b>47</b>

# STRATEGIC SITE 1: REVERE SUGAR

<b>Address</b>	<b>280 Richards Street</b>
<b>Map Location</b>	<b>74°0'55.954"W 40°40'22.788"N</b>
<b>Zoning</b>	<b>M3-1</b>
<b>Block and Lot</b>	<b>612 / 150</b>
<b>Ownership</b>	<b>Thor 280 Richards St.</b>
<b>Lot Area (s)</b>	<b>666,600 sqft (15.3 acres)</b>
<b>Existing Buildings</b>	<b>N/A</b>

## Summary

Located at the intersection of Richards and Beard Streets, this waterfront site is currently vacant. While the tax lot is mapped at just over 15 acres, the land area is only 7.34 acres or 319,639 square feet. The remainder of the lot is underwater.

Once occupied by the American Molasses Company of New York, the Revere Sugar Refinery, and the Brooklyn Fire and Brick Works, this site also once had active maritime uses with wharves occupied by Columbus Marine Company and the Canadian Merchant Marine where warehousing and production activities took place through the mid-20th Century. In 2006, the site was acquired by Joe Sitt of Thor Equities. Since then, the structures on site have been demolished and the site has been rendered vacant and inactive. It is currently zoned M3-1.

The long history of maritime and industrial uses indicates a potential for contamination on this site. Specifically, the storage and burning of coal on site has been identified through historical research of Sanborn Fire Insurance maps. Evidence of historic fill was also identified from historical map analysis, as much of the waterfront was originally marshland. The site is listed in the SPEED database as a Vacant Commercial or Industrial Property.

# STRATEGIC SITE 1: REVERE SUGAR



## STRATEGIC SITE 2: ERIE BASIN COAL YARD

<b>Address</b>	225 Richards Street 152 Dwight Street
<b>Map Location</b>	74°0'47.062"W 40°40'25.994"N
<b>Zoning</b>	M1-2
<b>Block and Lot</b>	605 / 1, 24
<b>Ownership</b>	Rachels Island 37 Van Dyke LLC.
<b>Lot Area (s)</b>	74,000 sqft (1.7 acres) 20,000 sqft (.46 acres)
<b>Total Site Area</b>	94,000 sqft (2.16 acres)
<b>Existing Buildings</b>	1
<b>Building Area</b>	17,650 sqft

## Summary

Located at 225 Richards Street, this site is bounded by Beard, Richards, and Van Dyke Streets. A portion of this site, Lot 1, is currently used for bus parking. The other portion, Lot 24, is occupied by what appears to be an inactive industrial building.

This site has a long history of industrial uses that indicate a potential for environmental contamination. Certificates of Occupancy kept by the NYC Department of Buildings indicate that in 1946 there was a coppersmith and rigging shop on the site and that the property was used mainly for motor vehicle repairs and garage space through the second half of the 20th century. The site is currently zoned M1-2.

Based on historical research of Sanborn Fire Insurance maps, this site was once used for the Erie Basin Coal yard and E.B. Iron works dating back to 1886. In 1904, there was a ship-smith and machinist, the Donald McDonald lumber yard, J.F. Kelley Dock Builders and Contractors, and the continued occupancy of E.B. Iron works. By 1915, the western portion of the lot was being used as a bowling alley, while electric shop operations and the lumber yard remained active. By 1939, the bowling alley was converted to BGT Crosstown Trolley Terminal and the Red Hand Compositions Company, Inc. replaced the lumber yard. At this time, a machine shop and H.W. Ramberg Inc. Ship Repair operated on the eastern portion of the site. While ship repair remained in operation on the site through the middle of the 20th century, parking and coal storage occupied most of the site by 1950.

Based on the New York State Department of Environmental Conservation Spill Records Database, a "deliberate" spill of an unknown amount of asbestos and waste oil occurred on the site in April of 2003. This spill is recorded as having impacted the soil resources around the site and it is currently listed as "not closed." According to records kept by NYC DOB, Lot 24 was issued Certificates of Occupancy in 1942 and 1967 for a pattern and machine shop which indicates the presence textile manufacturing.

Given the history of industrial uses on the site including ship repair, electrical work, machine shop, iron works, and coal storage as well as the presence of an Open Spill of asbestos and waste oil, it is likely that there is environmental contamination.

## STRATEGIC SITE 2: ERIE BASIN COAL YARD



## STRATEGIC SITE 3: COLUMBIA STREET

<b>Address</b>	640 Columbia Street
<b>Map Location</b>	74°0'32.315"W 40°40'15.831"N
<b>Zoning</b>	M3-1
<b>Block and Lot</b>	612 / 99
<b>Ownership</b>	640 Columbia Street LLC.
<b>Lot Area (s)</b>	176,041 sqft (4.04 acres)
<b>Existing Buildings</b>	N/A

### Summary

Located at 640 Columbia Street at the intersection of Halleck and Columbia Streets, this site is partially vacant. A portion of the site is currently used for materials storage and cement mixing and loading operations. Approximately 176,000 square feet, the site is adjacent to IKEA and the Columbia Street Esplanade, a significant waterfront access point in Red Hook. Based on real estate sales research, this property is currently listed for lease or sale.

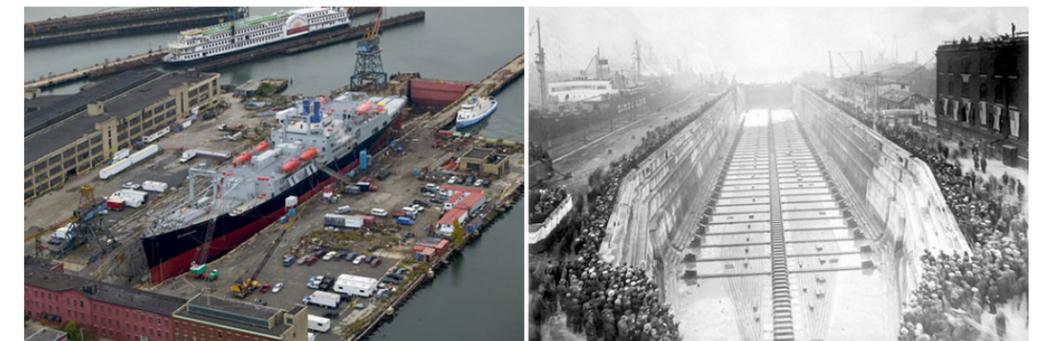
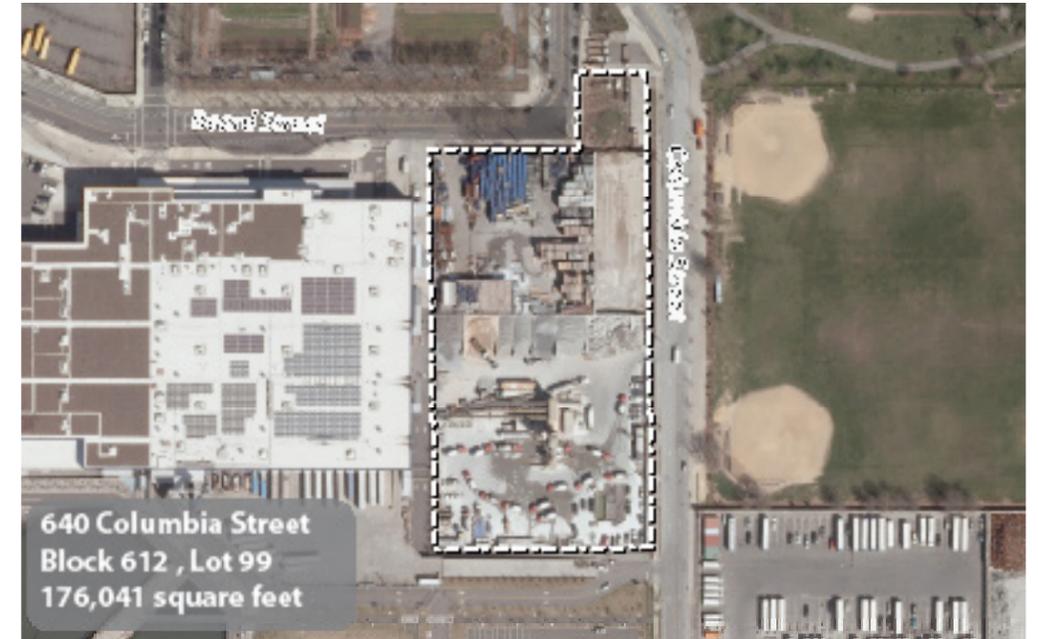
Based on building records kept by the New York City Department of Buildings, the most recent certificate of occupancy issued in 2010 permits the operation of a concrete batch plant. Throughout the 1990's four Certificates of Occupancy were issued for a transfer station and accessory mechanical rooms.

Based on historical research using Sanborn Fire Insurance maps, the site was marshland until at least 1928 when the land had been significantly filled in but remained without a built structure. Over time, the development of dry docks around the Erie Basin led to the reclamation of the land upon which this property sits. Today, the property is listed in the SPEED Vacant Property Database as a Vacant Commercial or Industrial Property.

On the adjacent lot, presently occupied by IKEA, there are two records listed in the NYS Department of Environmental Conservation's Petroleum Bulk Storage Database. There is also one record of an Open Spill registered in January, 2009 of #6 Fuel Oil of an unspecified amount. According to Sanborn Fire Insurance maps from 1903, JN Robbins Company Shipyards operated the dry docks and graveyard where IKEA is presently located. This lot was historically used as dry docks belonging to and operated by the US Dredging Corporation, and as well as dry docks operated by Todd Shipyards. Today the footprint of the historic graving docks is marked in a stone outline in the IKEA parking lot.

Given the historical significance of this site in the context of the shipping and dry dock activity that took place in the Erie Basin, its present industrial cement operations, and its adjacency to petroleum bulk storage and an open spill, it is likely that this site has environmental contamination.

## STRATEGIC SITE 3: 640 COLUMBIA STREET



Source: Left, John Bartelstone ; Right, Brooklyn Historical Society, "Dry Dock 1, 1928"

## STRATEGIC SITE 4: THE RED HOOK GRAIN TERMINAL

<b>Address</b>	685 Columbia Street
<b>Map Location</b>	74°0'25.291"W 40°40'7.862"N
<b>Zoning</b>	M3-1
<b>Block and Lot</b>	614 / 1
<b>Ownership</b>	Gowanus Industrial Park
<b>Lot Area (s)</b>	1,981,175 (45 acres)
<b>Total Site Area</b>	572,885 (13 acres)
<b>Existing Buildings</b>	3
<b>Building Area</b>	38,122 sqft

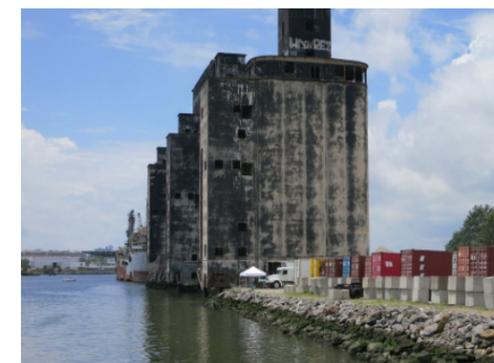
### Summary

Located at 685 Columbia Street, this is the site of the historic Red Hook Grain Terminal. Built in 1922 on the edge of the Erie Basin, it was designed to receive and process large grain shipments in an attempt to direct grain related traffic to Red Hook. The project was related to a larger plan to update the New York State Barge Canal, presently IKA, and empower the Erie Basin to accommodate diesel powered ships. The mapped area of the tax lot is over 45 acres with three built structures, each of which appear vacant. However, the land area of the site is only 572,885 square feet (about 13 acres). The remainder of the lot is underwater. The site is also adjacent to the Columbia Street Waterfront Esplanade, a significant public waterfront access point in Red Hook, and the Red Hook Recreational Area baseball fields. The site is currently zoned M3-1.

Partially vacant with some bus, vehicle, truck, and storage of materials and containers, the site is currently owned and operated by the Gowanus Industrial Park organization, also known as the Gowanus Bay Terminal. According to the Gowanus Bay Terminal website, the site is currently used as a shipping terminal as well as bulk storage of natural and manufactured aggregates, rock salt, scrap metal, and reclaimed lumber. Recently, this site was subject to intense debate regarding the role it could play in the EPA's dredging activities associated with the Superfund cleanup of the Gowanus Canal. However, the proposed disposal facility and a plan to use the material as fill for the portion of the property that extends into the Gowanus Bay were abandoned. In September, 2013 the EPA announced, "With community input, EPA has decided on the option in the proposed plan that will require the disposal of the least contaminated sediment at a facility out of the area rather than building a disposal facility in the water near Red Hook."

Based on historical research of Sanborn Fire Insurance maps, the bulkhead on this property was established in the 1830s. Maps from 1909 show that the site was, at one point, a part of the Brooklyn Basin, but by 1928 the entire property had been filled in and the grain terminal built as described above. The site was an integral part of the shipping waterfront. Historical maps indicate that nearly the entire site was once marshland and subsequently filled; enabling industrial operations to take place here.

## STRATEGIC SITE 4: THE RED HOOK GRAIN TERMINAL



# STRATEGIC SITE 5: COFFEY AND OTSEGO

<b>Address</b>	151 Dwight Street 147 Dwight Street 143 Dwight Street 40 Otsego Street 60 Otsego Street
<b>Map Location</b>	74°0'11.503"W 40°40'9.216"N
<b>Zoning</b>	M1-1
<b>Block and Lot</b>	589 / 2, 3, 5, 6, 6, 8, 9, 12, 16, 160
<b>Ownership</b>	Dragonhearth Realty John and Jo Ann Guarino
<b>Lot Area (s)</b>	1,000 sqft 1,000 sqft 1,000 sqft 1,000 sqft 4,500 sqft 1,875 sqft 1,875 sqft 4,673 sqft 15,782 sqft 4,000 sqft
<b>Total Site Area</b>	36,705 sqft (.84 acres)
<b>Existing Buildings</b>	2
<b>Building Area</b>	3,912 sqft

## Summary

Located at the north-west intersection of Coffey and Otsego Streets, this potential strategic site is the assemblage of 10 tax lots on tax block 589. Largely vacant land, there are two vacant buildings on the site. Ownership of 8 of the lots is under Dragonhearth Realty. Lot 8 is listed under the ownership of John and Jo Ann Guarino, and Lot 9 has no data related to ownership in the City's Digital Tax Map data. Cumulatively, the site is 36,705 square feet and the zoning is M1-1. Lots 7 and 11, not included in the potential Strategic Site, are currently occupied residential buildings.

Historically, the lots on the western portion of the block (Lots 2, 3, 4, 5, 6, 106, 8, and 9) were used for residential purposes, with "shanties" appearing on Sanborn Fire Insurance maps as early as 1904. Lots 16 and 12, the largest lots on the site occupy the eastern half of the block. Historical Sanborn maps indicate the presence of a junk yard and wagon house in 1915. The junk yard remained through 1950 on Lot 16, but by this time, a "motor house" occupied Lot 12. As previously mentioned, the site is vacant land with the exception of a vacant three-story building connected to a one-story building traversing Lots 16, 2, and 3. On a site visit in August 2013 signage indicated that the property was for sale.

# STRATEGIC SITE 5: COFFEY AND OTSEGO STREETS



## STRATEGIC SITE 6: CHESEBROUGH SITE

<b>Address</b>	44 Ferris Street 219 Sullivan Street 236 Wolcott Street
<b>Map Location</b>	74°0'59.141"W 40°40'49.23"N
<b>Zoning</b>	M2-1
<b>Block and Lot</b>	514 / 1, 40, 2
<b>Ownership</b>	1989 Realty Corp. NBB Realty Corp. Port Authority of New York
<b>Lot Area (s)</b>	50,000 sqft (1.15 acres) 49,740 sqft (1.15 acres) 47,000 sqft (1.08 acres)
<b>Total Site Area</b>	146,740 sqft (3.37 acres)
<b>Existing Buildings</b>	1
<b>Building Area</b>	3,294 sqft

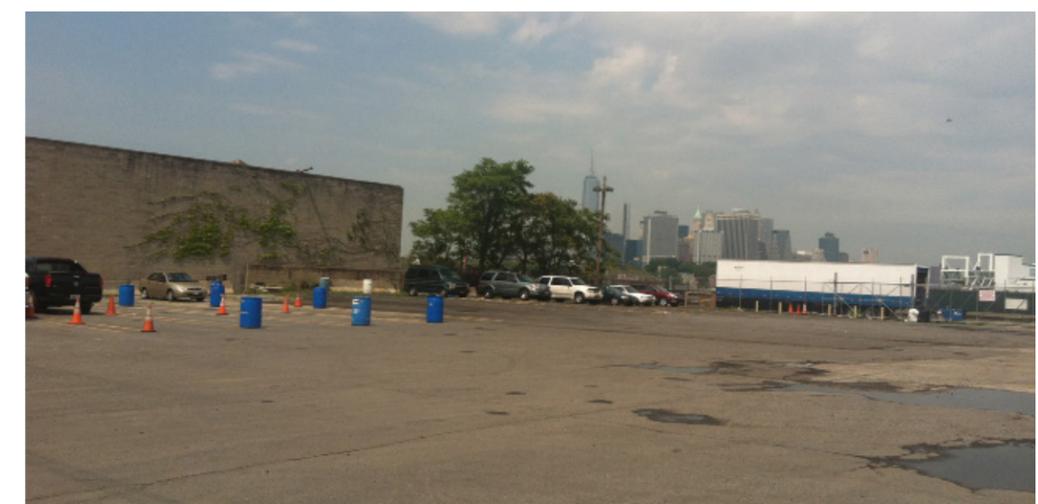
## Summary

Bounded by Ferris Street and Buttermilk Chanel, this site has a long history in industry and manufacturing. The potential Strategic Site is comprised of three separate tax lots on block 514: from west to east, Lots 21, 40 and 1 are respectively owned by the Port Authority of New York, NBB Realty Corporation, and 1989 Realty Corporation. Combined, the site is 146,740 square feet and largely used for parking and vehicle storage. There is one built structure, a one-story garage of approximately 3,000 square feet, on the Port Authority site, which is used for parking related to the Brooklyn Cruise Terminal.

Based on historical Sanborn Fire Insurance maps, Lot 21 was once operated by the Mutual Grain Ceiling Company's lumber yard, reflecting Red Hook's long history involving the grain trade around the turn of the 19th century. Around this time, the rest of the site was used in part for the Chesebrough Manufacturing Company and oil refinery. Established by Robert Chesebrough, the inventor of Vaseline, Chesebrough Manufacturing became a large establishment with operations on multiple sites in the area. By 1915, historic maps indicate coal storage and L. Mundel and Sons Cork works on the eastern portion of the site. By 1950, the site continued to develop to support industries related to the oil trade. Historic maps from this time indicate the presence of the Kuhne Libby Company, lubricating oil and kerosene storage, and operations of the Comet Fuel Company. On the eastern portion of the lot (nearest to Ferris Street) the site was used for the manufacturing of insecticide as well as laundry and dry cleaning supply. On the neighboring block to the south, historic maps from 1886 indicate the presence of the Manhattan Chemical Company Works, a fertilizer factory. This site was also used for the operations of the American Ice Manufacturing Company, the Z. Mills Tar Products Company, and the storage of resin related to the operations of Hammond and CJ Naval Stores. Certificates of occupancy issued in 1969 show the transition of this site from heavy industrial uses to parking and storage. In 1969, certificates of occupancy for Lot 1, the eastern-most portion of the site, permit commercial vehicle storage and the storage of crated motor vehicles for shipping and dead storage.

Lot 40, the middle lot on this potential Strategic Site, is the site of an Open Spill at 219 Sullivan Street. In July, 2003 an unknown amount of lube oil spilled due to an unknown cause affecting soil resources on the site.

## STRATEGIC SITE 6: CHESEBROUGH SITE



## STRATEGIC SITE 7: NEW YORK DOCK COMPANY

<b>Address</b>	42 Ferris Street
<b>Map Location</b>	74°0'54.933"W 40°40'50.299"N
<b>Zoning</b>	M2-1
<b>Block and Lot</b>	515 / 1
<b>Ownership</b>	City of New York
<b>Lot Area (s)</b>	141,144 sqft
<b>Existing Buildings</b>	1
<b>Building Area</b>	7,672 sqft

## Summary

Located at the site of the historic New York Dock Company, this potential Strategic Site is bounded by Ferris Streets and Buttermilk Channel between Sullivan and King Streets. The entire 141,144 square-foot block is used for parking. The western portion of the lot is currently operated by the Port Authority of New York and the Brooklyn Cruise Terminal. The eastern portion of the lot is operated by Two Friends Auto Sales. There is one built structure, a 7,672 square foot garage, on the site. The site is currently zoned M2-1. Today, King Street is mapped through the site but is not accessible, and this block is merged with the larger site occupied by the Brooklyn Cruise Terminal parking lot. Associated with the site, NYC Department of Buildings has approved the installation of a new water main for the first phase of the Governors Island Water Source and Distribution Project. The site is currently under possession of the City of New York.

Historic Sanborn Fire Insurance maps from 1886 indicate that the site was once used for tobacco inspection at the water's edge with the Stranahan Stores running the length of Sullivan Street. In 1901, the NY Dock Company purchased the Atlantic Basin from the Atlantic Dock Company, but many of the warehouses that were constructed around this time have since been demolished as a result of the abandonment of traditional storehouses and piers and the eventual acquisition of this and neighboring sites by the City of New York in the 1950s. By 1904, the Clinton Stores had been established along King Street, and the site was occupied mainly by the New York Dock Company Terminal Station. By 1915, the site was not only occupied by NY Dock Company, but also by PE Anderson and Company Dry Drugs, and the Simmons Manufacture Company, which produced beds with materials such as finishing agents and lacquering. In 1939, these maps show that the western portion of the lot was used for crude drug storage, the manufacturing of soap, and chlorazone, a popular sealant. Around the same time, the eastern portion of the lot was operated by the Acorn Insulated Wire Company. This history of this site is closely tied to that of the New York Dock Company, which was at one point the largest employer of longshoreman in Red Hook.

Records kept by the NYC Department of Buildings indicate that a certificate of occupancy was issued for this site in 1954 for the warehousing of chemicals, solvents, laundry soaps, and powders. More recently, complaints were filed against the site for the failure to maintain the structure due to Hurricane Sandy when a 20x30 foot sheet of roofing was documented as missing.

With a long history in maritime and industrial uses, there is a potential for contamination on this site. Specifically, the manufacture of chemicals, drugs, solvents, laundry soaps, powders, electric supplies, along with the use of varnishes and lacquer related to bed manufacture have been documented on historical Sanborn maps.

## STRATEGIC SITE 7: NEW YORK DOCK COMPANY



## STRATEGIC SITE 8A: LUQUER STREET

<b>Address</b>	18 Luquer Street 26 Luquer Street 28 Luquer Street 24 Luquer Street
<b>Map Location</b>	74°0'17.05"W 40°40'43.163"N
<b>Zoning</b>	M1-1
<b>Block and Lot</b>	520 / 13, 17, 18, 16
<b>Ownership</b>	18-24 Luquer Street R Luquer Street LLC
<b>Lot Area (s)</b>	6,500 sqft (.15 acres) 2,500 sqft (.06 acres) 2,250 sqft (.05 acres) 2,000 sqft (.05 acres)
<b>Total Site Area</b>	13,250 sqft (.31 acres)
<b>Existing Buildings</b>	N/A

## Summary

A cluster of lots on Luquer Street between Columbia and Hicks Streets, this site is currently a vacant lot split between two owners: Luquer Street LLC and 18-24 Luquer Street. Based on observations made on a site visit in August 2013, there was no physical demarcation of property lines on the site. A total of 13,250 square feet, these lots are zoned M1-1 with no built structure on the site.

Historic Sanborn Fire Insurance maps show that this site was largely used for residential dwellings through the late 19th to mid-20th centuries. A portion of the site, Lot 18, was issued a Certificate of Occupancy from the NYC Department of Buildings in 1967 for auto repairs and body work, which included the use of oxygen acetylene for welding and paint spraying. This site is located adjacent to industrial and manufacturing operations which have the potential to contribute contamination on this potential Strategic Site. Adjacent Lot 26 was the site of the J. Lee Smith Company Dry Paint Works from at least 1886 through 1939. By 1950, this property is shown to be the site of Cardinal Engine and Boiler Works where there were iron works and machine shop operations. This site is currently operated by Rite Way Truck which offers tank cleaning, tank truck service and plumbing services which may include the handling of hazardous waste. This potential Strategic Site is also adjacent to potential Strategic Site 9B. On this adjacent site, another vacant lot, it appears that some Rite Way Truck operations also take place. This potential Strategic Site shares the block with Defontes of Red Hook sandwich shop, a local culinary destination for residents and workers in the neighborhood.

Further, the current site of Rite Way Truck is registered in the NYS DEC Petroleum Bulk Storage Database for 6 total tanks, four of which are in service. Based on the NYC OER SPEED Database, the adjacent properties of potential Strategic Site 9B are registered in the Vacant Property Database indicating the likely presence of historic fill.

## STRATEGIC SITE 8A: LUQUER STREET



## STRATEGIC SITE 8B: NELSON STREET

<b>Address</b>	Nelson Street
<b>Map Location</b>	74°0'18.437"W 40°40'42.677"N
<b>Zoning</b>	M1-1
<b>Block and Lot</b>	520 / 39 , 40 , 41 , 42
<b>Ownership</b>	Budweid Corp L Lenweird Rlty Corp
<b>Lot Area (s)</b>	2,500 sqft (.06 acres) 2,500 sqft (.06 acres) 2,500 sqft (.06 acres) 2,675 sqft (.06 acres)
<b>Total Site Area</b>	10,175 sqft (.23 acres)
<b>Existing Buildings</b>	N/A

### Summary

A cluster of lots on Nelson Street between Columbia and Hicks Streets, this site is currently vacant; however, from field observations these lots appear to be used by Rite Way Truck, a truck and tank cleaning facility. The four lots that comprise this potential Strategic Site are split between the ownership of two entities: Lenweid Realty Corp and Budweid Corp. A total of 10,175 square feet, this site is zoned M1-1 with no built structure.

While historic Sanborn Fire Insurance maps show that this site was largely used for residential dwellings through the late 19th to mid-20th centuries, NYC OER's SPEED portal also indicates the presence of historic fill on each lot. Further, it is located adjacent to industrial and manufacturing operations that have the potential to cause contamination on this site. Lot 26 to the east is the site of J. Lee Smith Company Dry Paint Works from at least 1886 through 1939. By 1950, this property is shown to be the site of Cardinal Engine and Boiler Works, in which there were iron works and machine shop operations. This site is currently operated by Rite Way Truck which offers tank cleaning, tank truck service and plumbing services which may include the handling of hazardous waste. This potential Strategic Site is also adjacent to Strategic Site 9A, another vacant lot for which a Certificate of Occupancy for auto repairs and body work involving oxygen acetylene for welding and paint spraying was issued in 1967. To its west, Lot 1 is currently under the operation of Nutone Productions, a commercial and residential contractor for counters, cabinetry and millwork. This property was the location of what was once an underwear factory as evidenced by historic Sanborn maps from 1939. Defontes of Red Hook sandwich shop also shares the block.

Further, the adjacent site of Rite Way Truck is a registered in the NYS DEC Petroleum Bulk Storage Database for 6 total tanks, four of which are in service.

## STRATEGIC SITE 8B: NELSON STREET



## STRATEGIC SITE 9: SMITH STREET

<b>Address</b>	659 Smith Street 627 Smith Street 611 Smith Street
<b>Map Location</b>	74°0'1.626"W 40°40'9.043"N
<b>Zoning</b>	M3-1
<b>Block and Lot</b>	495 / 1 493 / 1 491 / 1
<b>Ownership</b>	CF Smith LLC
<b>Lot Area (s)</b>	40,000 sqft (.91 acres) 45,400 sqft (1.04 acres) 43,750 sqft (1.0 acre)
<b>Total Site Area</b>	129,150 sqft (2.96 acres)
<b>Existing Buildings</b>	5
<b>Building Area</b>	87,600 sqft

## Summary

Located on Smith Street between Halleck and Bay Street, this potential Strategic Site is comprised of three adjacent tax blocks under the ownership of CF Smith, LLC and Red Hook Developers. Currently, there are multiple warehouse style buildings on the site, however they are in disrepair and are seemingly inactive. The site is currently zoned M3-1 (where the allowable FAR is 2.00) and is built to an FAR of 1.00.

The lots are situated on the bank of the Gowanus Canal, which is on the National Priorities List and enrolled in the US EPA's Superfund program. The southernmost lot (627-641 Smith Street) is registered in the NYS DEC's Open Spill Database; due to an unknown cause, in April 2005 an unknown amount of petroleum spilled affecting groundwater resources. Further, given its history along the waterfront of the Gowanus Canal, the presence of fill material on this site is likely.

Historic Sanborn Fire Insurance maps indicate that tax block 495 was once used for manufacturing between 1886 and 1904. By 1915 the site was operated by the NY Knickerbocker Real Estate Company and the historic maps indicate that there was fertilizer storage on the site. Blocks 493 and 491 also have a history of warehousing and industry. Maps from 1904 and 1915 show that the Barret Manufacturing Company operated large tar storage tanks on Block 493. Block 491, the northernmost block on this potential Strategic Site, was used for hay storage during the beginning of the 20th century. By 1939, Bowne- Morton's Stores Incorporated operated public warehousing on the site.

Given the history of tar storage, fertilizer storage, and this site's direct adjacency to the Gowanus Canal Superfund Site, the Smith Street potential Strategic Site has the potential for contamination.

## STRATEGIC SITE 9: SMITH STREET



## STRATEGIC SITE 10: BROOKLYN CLAY RETORT

<b>Address</b>	419 Van Brunt Street
<b>Map Location</b>	74°0'52.812"W 40°40'30.891"N
<b>Zoning</b>	M1-2
<b>Block and Lot</b>	604 / 1, 4, 5
<b>Ownership</b>	Beard Street Acquisitions
<b>Lot Area (s)</b>	16,225sqft (.37 acres) 2,250 sqft (.05 acres) 1,800 sqft (.04 acres)
<b>Total Site Area</b>	20,275 sqft (.47 acres)
<b>Existing Buildings</b>	N/A

### Summary

With frontages on Beard, Van Dyke, and Van Brunt Streets, this site is comprised of three tax lots under the common ownership of Beard Street Acquisitions LLC. The site is currently used for parking and truck storage related to the adjacent warehousing operations of Red Hook Cold Storage, LLC. Based on observations of the site, the lots are largely underutilized, especially the portions of the site that front Van Brunt Street and are adjacent to residential buildings. This potential Strategic Site is currently zoned M1-2, has no buildings, and is 20,275 square feet. OER's SPEED Database identified this site as a Vacant Property.

Historic Sanborn Fire Insurance maps indicate that the block on which this Strategic Site is situated was once the site of the Brooklyn Clay Retort and Fire Brick Works complex. Established in 1854 by J.K. Brick, the Brooklyn Clay Retort processed and manufactured materials for gas works construction including "fire" bricks, designed to line heat-intensive environments like kilns and furnaces, as well as clay retorts, vessels in which coal can be heated to produce illuminating gas. The lots that comprise the potential Strategic Site are adjacent to the historic Brooklyn Clay Retort. Historic maps from 1915 show that Lot 5, currently used for truck storage, was operated by the Brooklyn Bolt and Forging Company. These maps indicate that galvanizing occurred on the site, a process by which iron or steel is coated with zinc to protect it from rust and improve its appearance. Similar industrial activity continued on Lot 5 through the middle of the 20th century, with historic maps identifying "iron works" as the primary activity on the lot. Lot 1, the largest tax lot on this potential Strategic Site, is shown to be the site of a forging shop in 1915. By 1950, this site was being used for marine contracting, supplies, and paint storage which reflect the site's proximity to the Erie Basin and the shipping and ship repair activity that took place.

The potential Strategic Site lies adjacent to a registered site in the NYS DEC Petroleum Bulk Storage database.

## STRATEGIC SITE 10: BROOKLYN CLAY RETORT



## STRATEGIC SITE 11: VAN BRUNT AND COFFEY

<b>Address</b>	N/A ; Multiple addresses
<b>Map Location</b>	74°0'51.456"W 40°40'32.171"N
<b>Zoning</b>	M1-1
<b>Block and Lot</b>	598 / 1, 2, 3, 4, 13, 14, 15, 16, 49, 148
<b>Ownership</b>	Red Hook Building Company 397 Van Brunt Inc. Deborah Van Dyke Holding Van Dyke Farm Inc. Gregory OConnell
<b>Lot Area (s)</b>	1,800 sqft 1,800 sqft 1,800 sqft 1,800 sqft 2,150 sqft 4,933 sqft 2,067 sqft 2,500 sqft 2,000 sqft 2,500 sqft
<b>Total Site Area</b>	23,350 sqft (.54 acres)
<b>Existing Buildings</b>	N/A

### Summary

A cluster of ten tax lots that front Van Dyke, Van Brunt, and Coffey Streets, this potential Strategic Site is largely vacant with what appears to be junk storage on the northern portion of the site. A total of 23,350 square feet, this site is zoned M1-1. Within the potential Strategic Site, there are two clusters of common ownership: Lots 1, 2 and 3 are owned by Red Building Company and Lots 13, 14, 15 and 16 are owned by Deborah Van Dyke Holding. The remaining three lots are owned by 397 Van Brunt Inc., Van Dyke Farm Inc., and Greg O'Connell, a prominent land owner in Red Hook. Each lot is listed in the OER SPEED Vacant Property Database and is expected to contain historic fill.

Historic Sanborn Fire Insurance maps indicate that this site was mainly used for residential dwelling units through the 19th and 20th centuries. However, historic manufacturing on the adjacent properties indicate the possibility that this strategic site may be contaminated. Through the turn of the 19th century, Lots 43, 40 and 39 were operated by the Knowles Brothers Company, which manufactured saltpeter, also known as potassium nitrate. By 1939 through at least 1950, Sanborn maps show the presence of soap powder manufacturing by the American Soap Powder Company. Historic maps from 1905 and 1939 show operations of the Brooklyn Fire and Brick Works Company and coal storage on Lot 30 on the eastern end of the block.

According to records kept by the NYC Department of Buildings, Lot 4 has been cited for violations for work without permits (2001). In addition, Lot 16 was granted a permit in 2005 for open commercial vehicle storage.

## STRATEGIC SITE 11: VAN BRUNT AND COFFEY



# STRATEGIC SITE 12: DIKEMAN AND CONOVER

<b>Address</b>	N/A ; Multiple addresses
<b>Map Location</b>	74°0'51.456"W 40°40'32.171"N
<b>Zoning</b>	M1-1
<b>Block and Lot</b>	585/ 25 , 26 , 28 , 29
<b>Ownership</b>	157 - 159 Dikeman Street Conover LLC
<b>Lot Area (s)</b>	2,500 sqft (.06 acres) 2,500 sqft (.06 acres) 2,500 sqft (.06 acres) 2,500 sqft (.06 acres)
<b>Total Site Area</b>	10,000 sqft (.23 acres)
<b>Existing Buildings</b>	N/A

## Summary

A cluster of four tax lots the front Conover and Dikeman Streets, this potential Strategic Site is largely vacant with minimal parking on the site. A total of 10,000 square feet, this site is currently zoned M1-1. Ownership is split between two owners: Lots 25 and 26 are owned by 157-159 Dikeman Street, and Lots 28 and 29 are owned by Conover, LLC.

Based on historic Sanborn Fire Insurance maps, the site had been mainly used for residential and commercial store fronts through much of the 20th century with the exception of Lots 29 and 28, which were used for a pork packing operation. While these historic uses do not indicate the presence of hazardous materials or environmental contamination, each lot is listed in the OER SPEED Vacant Property Database, indicating the presence of historic fill.

# STRATEGIC SITE 12: DIKEMAN AND CONOVER



## STRATEGIC SITE 13: KARBO BRONZE

<b>Address</b>	1 Van Dyke Street
<b>Map Location</b>	74°0'39.662"W 40°40'24.974"N
<b>Zoning</b>	M1-1
<b>Block and Lot</b>	600 / 101
<b>Ownership</b>	GHI Realty
<b>Lot Area (s)</b>	7,500 sqft (.17 acres)
<b>Existing Buildings</b>	N/A

## Summary

Located at 1 Van Dyke Street between Dwight and Otsego Streets, this lot is currently vacant with no built structures. A total of 7,500 square feet, it is bounded by mixed commercial and residential buildings on either side. The site is currently owned by GHI Realty and zoned M1-1.

According to records kept by the NYC Department of Buildings, this site was issued Certificates of Occupancy in 1944 and 1962 for factory operations. These activities included the casting of ship fittings. Building records also show that this lot was the site of the Karbo Bronze Factory and Foundry. Listed in the United States Toxic Release Inventory and as a regulated facility under the Resource Conservation and Recovery Act, the Karbo Bronze Factory performed industrial activities such as aluminum die-casting as well as aluminum and copper casting.

Based on historic Sanborn Fire Insurance maps, this site was adjacent to an "Old Tin Can Utilization Plant" where tin melting activities took place in 1904. By 1915, this adjacent lot (presently Lot 11) was used for steel and iron storage and the adjacent lots to the east (presently Lot 22) were used for the Gilbert M. Edgett and Co Black Smith and Machine Shop. By 1939, these maps show the Strategic Site as occupied by Karbo Bronze Foundries. The adjacent Lot 22 was occupied by the Mercantile Engineering and Repair Company Inc, a blacksmith, and a machine shop. Lot 19, also adjacent to this potential Strategic Site, was used as a welding facility. Historic maps from 1950 show similar uses on and near the potential Strategic Site including machine shops, a coppersmith, a black smith, and the bronze foundry.

Adjacent to this site, there are 5 petroleum tanks registered for the Karbo Bronze Foundries in the NYS DEC Petroleum Bulk Storage Database. While the tanks are administratively closed, there is a potential for continued presence of petroleum impact from these historic tanks on this potential Strategic Site.

## STRATEGIC SITE 13: KARBO BRONZE



# FLOOD RISK AND RESILIENCY

*As a coastal area, Red Hook is located within a flood zone, making it particularly vulnerable to the economic and infra-structural challenges associated with flood damage. Characterized by an older building stock, industrial businesses and facilities, attached and semi-attached structures, and ground floor retail along commercial corridors, the built environment in Red Hook is difficult to retrofit for flood resiliency. As such, flood vulnerability may be a significant obstacle for economic development in Red Hook. Existing businesses that lack the resources to invest in flood resilient renovations or to pay increasing flood insurance premiums may choose to relocate out of the flood zone, while prospective firms may subsequently see Red Hook as a higher risk place to do business. Further, environmental contamination and the containment of hazardous materials and waste is uniquely problematic in a flood zone as the potential for wide-spread contamination is considerable. This document is meant to provide a preliminary basis to inform future planning and economic development strategies in light of these challenges.*

*Additional research and analysis has been done to summarize the short- and long-term damage and impact sustained by Hurricane Sandy (October 29, 2012), and identify factors that exacerbate flood damage risk in the manufacturing districts along the waterfront. In addition to synthesis and presentation of relevant data that is already available, extensive field work was conducted to begin to measure the vulnerabilities of buildings in the manufacturing districts of Red Hook. The findings of this survey are presented in this chapter and highlight the complicated nature of assessing flood vulnerability in light of an evolving regulatory environment oriented around flood resiliency. What follows is an overview of the significant impact of Hurricane Sandy on Red Hook. The Special Initiative for Rebuilding and Resiliency (SIRR) report, "A Stronger, More Resilient New York" released by the New York City Office of the Mayor, data from FEMA, the Office of Emergency Management, the CUNY Institute for Sustainable Cities, and the New York City Panel on Climate Change were foundational resources used for this section. These sources will be discussed in further detail later in this document.*

*Analysis of land use patterns, employment, and demographics done in previous sections of this report reflect pre-storm conditions. While the neighborhood has recovered somewhat since Sandy, many uncertainties remain. These uncertainties, including future flood risk implications, are explored in this chapter.*

## Data Sources

*The **Federal Emergency Management Agency (FEMA)** administers the **National Flood Insurance Program (NFIP)**, the Federal Program under which flood-prone areas are identified and flood insurance is made available to the owners of the property in participating communities.*

**100 – Year flood plain and Special Flood Hazard Areas (SFHAs)**

The 1 percent annual chance flood is also referred to as the base flood or 100-year flood (or flood plain). This is also known as a Special Flood Hazard Area (SFHA). SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Areas subject to inundation by the 1-percent-annual-chance flood event are determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

**Base Flood Elevation (BFE)**

The base flood is the national regulatory standard used by the National Flood Insurance Program (NFIP) and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. The Base Flood Elevation (BFE) is the elevation shown on the Flood Insurance Rate Map (FIRM) for Zones AE, AH, A1-30, or VE that indicates the water surface elevation resulting from a flood that has a 1-percent chance of occurring in any given year.

The following flood zones are referred to with respect to Red Hook:

**Zone A**

Zone A is comprised of the area subject to storm surge flooding from the 1% annual chance coastal flood. These areas are not subject to high velocity wave action but are still considered high risk flooding areas.

**Coastal A / AE**

Coastal A / AE: The portion of the Special Flood Hazard Area landward of a V zone (i.e., areas where wave heights are computed as less than 3 feet) that is mapped as an A or AE zone on the FIRM. While the wave forces in coastal A zones are not as severe as those in V zones, the capacity for the damage or destruction of buildings is still present.

**Zone V / VE**

Zone V / VE An area of high flood risk subject to inundation by the 1% annual-chance flood event with additional hazards due to storm-induced velocity wave action (a 3-foot or higher breaking wave). Typically, this is the area where the computed wave heights for the base flood are 3 feet or more. V zones are subject to more stringent building requirements and different flood insurance rates than other zones shown on the FIRM because these areas are exposed to a higher level of risk than other coastal flooding areas.

**500 - Year flood plain**

The .02 percent annual chance flood is also referred to as the 500 -year flood (or flood plain).

**Flood Insurance Rate Maps (FIRMs)**

FIRMs are the official map of a community on which FEMA has delineated the 1% annual chance (base) floodplain or Special Flood Hazard Area, the Base Flood Elevations (BFEs), and the risk premium zones applicable to the community. The FIRM is used to determine who must buy flood insurance and where floodplain development regulations apply. Once effective, FIRMs are available through the local community map repository and online.

**Preliminary Work Maps (PWMs)**

The preliminary work maps created for certain New Jersey/New York communities are an interim product created by FEMA in the development of preliminary Flood Insurance Rate Maps (FIRMs). The preliminary work maps reflect the full results of an ongoing coastal flood hazard study for the New York/New Jersey coast.

**Preliminary Flood Insurance Rate Maps (pFIRMs)**

A FIRM that is not yet effective that reflects the initial results of a flood map project performed by or for FEMA. The Preliminary FIRM (pFIRMs) is provided to the Chief Executive Officer (e.g., Mayor, County Commissioner, etc.) and floodplain administrator for each affected community and is available to all citizens for review both online or through the local community map repository (often the community planning or zoning office).

**North American Vertical Datum of 1988 (NAVD88)**

A datum is a vertical plane from which surveyors measure elevations. The North American Vertical Datum of 1988 (NAVD88) is the standard vertical datum used by the federal government for mapping projects.

**New York City Panel on Climate Change Flood and Climate Projections**

New York City Panel on Climate Change (NPCC), a body of leading climate and social scientists, has updated its 2009 projections in a report called *Climate Risk Information 2013* in order to inform planning for rebuilding and resiliency post-Sandy.

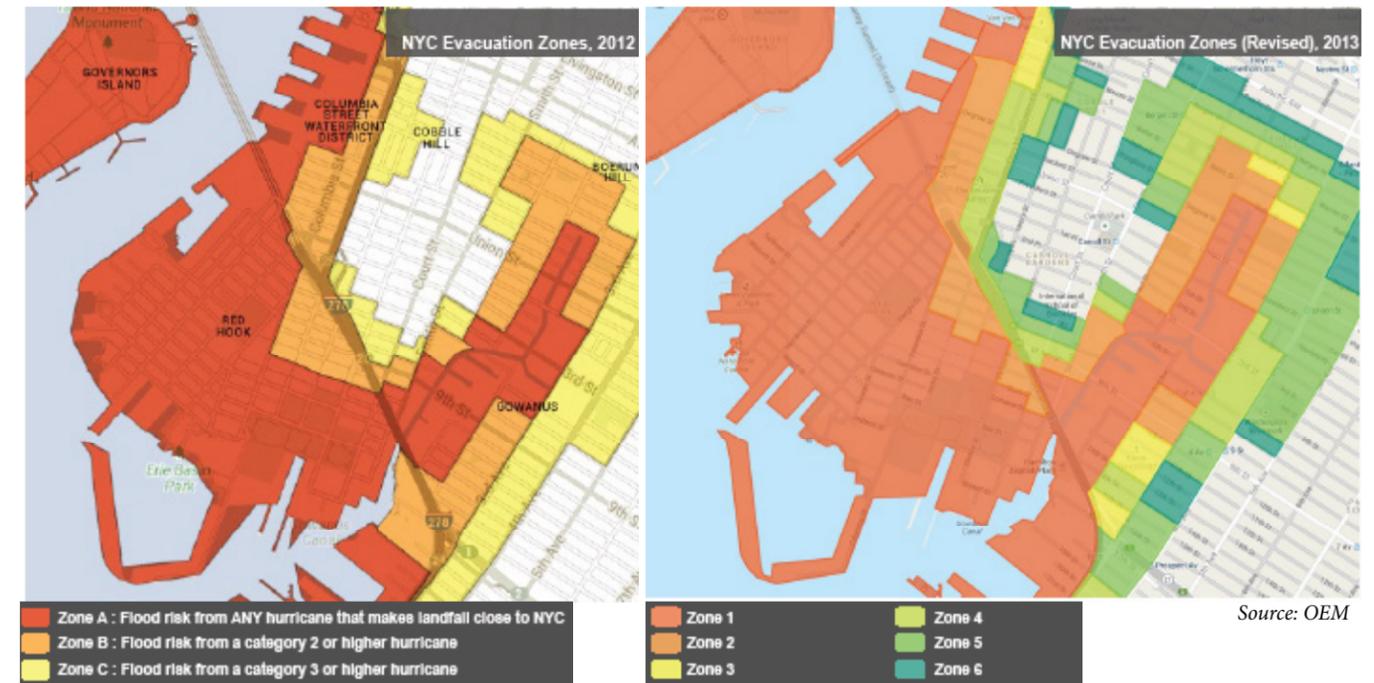
# HURRICANE SANDY

On October 29, 2012, as peak high tide approached New York Harbor, Hurricane Sandy made landfall in the New York City metropolitan area. This nearly 1,000 mile wide storm generated colossal storm surges causing widespread destruction of homes and businesses along 51 square miles of New York City's urban coastline, wiping out power for nearly 2 million people and shutting down transportation networks. Exceeding expected inundation mapped out by FEMA's "100-year" flood plains, storm surge highlighted weaknesses in the Federal Emergency Management Agency's (FEMA) Flood Insurance Maps (FIRMs) and the administration of the National Flood Insurance Program (NFIP). These maps, which define geographies for predicted flooding in the 100- and 500- year flood plains, are based on the statistical probability of the 1 percent chance and .02 percent chance flood events per year respectively, and had not been significantly updated since 1983. Despite what these maps indicate, many properties in Red Hook were unprepared for the storm and the resulting storm surge and flooding both in terms of structural resiliency and insurance coverage. Both the inundation of flood waters from Hurricane Sandy and the changes to the regulatory climate due to an upcoming map update and the implementation of the Biggert-Waters Flood Insurance Reform Act of 2012 that passed the summer before Sandy hit will have a lasting impact in the Red Hook neighborhood. The events of Hurricane Sandy have made clear the vulnerabilities faced by New York City as a coastal city. The implications of these vulnerabilities, and ultimately their solutions, may take different forms based on local neighborhood contexts. Red Hook is unique in its vulnerabilities based on the characteristics of the built environment, its local economy and demographics and the presence of environmental contamination.

## Evacuation Zones

In October of 2012, most of the Red Hook Peninsula was located in Hurricane Evacuation Zone A, an area defined by and identified by the City of New York as "at risk from any hurricane that makes landfall close to New York City." In preparation for the storm, this zone was deemed a Mandatory Evacuation Zone by Mayor Bloomberg. Preceding the storm, portions of Red Hook were in Evacuation Zone B, which is characterized as having potential flooding in a category 2 or higher hurricane. The extent of New York City's Hurricane Evacuation Zones with reference to Red Hook is shown below in Map 5.1. Since Hurricane Sandy, New York City has revised these zones and replaced the letter system with a graded number system. Designed to allow for flexibility in targeting areas for evacuation, zones now range from 1 through 6, and include 600,000 New Yorkers that had not been previously included. These new evacuation zones are shown below.

Map 5.1 Evacuation Zones



Source: OEM

## Storm Surge

As a result of storm surge generated by Hurricane Sandy, nearly the entire Red Hook peninsula suffered flooding. The severity of this flood has highlighted the vulnerabilities of Red Hook and New York City's urban waterfront as a whole. Flooding in Red Hook took three forms: (1) floodwaters directly from the New York Upper Bay, which were characterized by significant wave action at the water's edge, (2) inundation of water on upland streets and from secondary waterways such as the Gowanus Canal, and (3) from the drainage infrastructure below the street as the sewer system's catch basins, man-holes, and storm drains were overwhelmed by surge inundation. Red Hook was flooded from all three of its coasts- the Buttermilk Channel from the west, the Upper New York Bay from the south, and the Gowanus Bay and Gowanus Canal from the east. The rest of the peninsula was significantly flooded with waters that reached over 11 feet at the Gowanus Canal at the peak of the storm surge. Based on surveys done by the US Geological Survey, additional high water marks were also registered for points along the Red Hook waterfront above 11 feet.

Map 5.2 illustrates the inundation of flood water resulting from storm surge that occurred in Red Hook. This map, created post-storm, is based on the FEMA Modeling Task Force Surge Extent (November 2, 2012). Few areas were spared flooding south of the Gowanus Expressway except for a small area near the intersection of Coffey and Conover Streets, portions of the Red Hook Recreational Area, and the some of the courtyard areas within the Red Hook Houses development.

## Infrastructural Impact

Hurricane Sandy impacted critical systems across New York City and interrupted delivery of power and electricity, disrupted transportation services, and impacted waterfront infrastructure along the waterfront.

### Power Supply

Unlike the majority of Brooklyn which has an underground distribution system, the power supply for most of Red Hook's residential areas is distributed by way of over-head power lines. Along the waterfront, however, the power is distributed through underground networks that are typically more reliable, as they support the power system from multiple power sources. They are, however, more vulnerable in the event of flooding, when above-ground systems such as those found in the residential areas of Red Hook have a tendency to fare better than underground networks. As such, some areas of Red Hook remained with power after the storm. In other areas, such as Red Hook Houses and on Pioneer Street, power was lost for extended periods of time due either to network damage and outages caused by inundation or severe mechanical damage within buildings that rendered them incapable of connecting the building with the power supply. After the storm, residents of Red Hook Houses remained without power, heat, and running water for several weeks.

### Transportation Networks

The flooding induced by storm surge during Hurricane Sandy brought historic outages and impairment of mobility throughout the New York City area. As referenced earlier in this report, the subway network does not operate in Red Hook. In addition, the Gowanus Expressway largely segregates Red Hook from the rest of Brooklyn adding to the sense of isolation and lack of connectivity that residents feel particularly in the event of a natural disaster.

The closest subway station at Smith and 9th street (F and G train service) was in the flood zone; however, the station is elevated and out of reach of flood waters. At the time of the storm, the station was undergoing renovation. Its opening in May 2013 did not appear to be delayed by Hurricane Sandy. By November 1st, 2012 subway service along the F line was operational between downtown Brooklyn, Jay Street-MetroTech, and Avenue X in the Gravesend section of south Brooklyn. G train service was suspended along the entire line due to inundation of 3 million gallons of saltwater in the tunnel underneath Newtown Creek, known as the Greenpoint Tube, which connects Long Island City with Greenpoint. Service to this line was restored on November 7, 2012. However, as of June, 2013 the MTA has begun a process of repairs on the Greenpoint Tunnel resulting in temporary service interruptions and shut downs of G train service north of Nassau Avenue which concluded in mid-December 2013.

The Port Authority, MTA and the NYC DOT closed all of the city's major bridges and tunnels in preparation for the storm with the exception of the Lincoln Tunnel. This included the Hugh L. Carey (formerly known as the Brooklyn Battery Tunnel), the mouth of which opens in Red Hook. This tunnel, connecting Brooklyn with Lower Manhattan, is the longest continuous underwater tunnel in the United States. It was inundated from the Manhattan entrance with an estimated 43 million gallons of water. The tunnel remained closed to the public until 3 weeks after the storm.

### The Waterfront

In preparation for the storm, gangways were removed from boat terminals and landings in order to allow floating elements of docks and piers to move freely with the tide and surge to prevent damage to buildings and facilities along the waterfront. However, given the velocity of waves on the coastline, the surge damaged landings, docks, and bulkheads along the waterfront. In Red Hook, significant damage was sustained by water inundation to the Brooklyn Cruise Terminal, where the flood elevation reached higher than ten feet and resulted in the closure of the terminal for two months.

**Buildings** After the storm, the New York City Department of Buildings (NYC DOB) undertook inspections to assess damage to buildings along the waterfront and inundated areas throughout New York City. Assigning tags to buildings, inspectors in Red Hook marked two buildings along the waterfront with red tags where structural damage was evident. Twelve buildings were marked with yellow tags where portions of the building may have been unsafe or showed significant non-structural damage.

In some cases, residents were unable to occupy their homes and businesses were unable to operate. Either water damage compromised structural integrity or critical mechanical systems were rendered dysfunctional and unable to support habitable spaces. This issue was particularly problematic on Pioneer Street in Red Hook.

Commercial vitality was also threatened as a result of Hurricane Sandy. Dozens of significant businesses were severely affected in Red Hook, including small shops and restaurants along Van Brunt Street, and the local supermarkets in the neighborhood: Fairway on Van Brunt Street, C-Town on Mill Street, and Fine Fare on Lorraine Street. With significant damage to Fairway Market that took nearly 4 months to repair, the area was left without one of its most important anchors, stifling the recovery of the rest of the neighborhood including the smaller upland shops.

## MEASURING IMPACT

Data that's been represented and analyzed in preceding sections of this study provide an overview of land uses, industries, jobs, and demographic striations impacted by Sandy. As such, this data also illuminates the scope of potential impact in future floods. The extent of flooding in Red Hook during Hurricane Sandy and predicted increases in intensity and frequency of storms and sea-level rise make Red Hook a focal point for the study of potential resiliency strategies. These predictions and their implications are discussed later in this report. Beyond the scope of what was included in previous analysis, the implications of flooding and resiliency are measured with data supported by FEMA and field surveys conducted by the NYC Department of City Planning.



*Flooding on Beard Street, Red Hook, October 2012  
Photo Credit: Alan Chine, Newsmotion*



*Aftermath of Hurricane Sandy, Red Hook, October 2012  
Photo Credit: Michael Flesham*

## Flood Insurance Context

Citywide, since 1983, building owners with federally-backed mortgages in the 100- year flood zone have been required to maintain flood insurance. However, loose enforcement of the policy led many mortgages holders to let their policy lapse. In July 2012, the US Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12), which revised how flood insurance subsidies are managed by the National Flood Insurance (NFIP) program. According to FEMA: “Key provisions of the legislation will require the NFIP to raise rates to reflect true flood risk, make the program more financially stable, and change how Flood Insurance Rate Map (FIRM) updates impact policyholders. The changes will mean premium rate increases for some- but not all- policyholders over time.”

The Federal Emergency Management Agency (FEMA) defines coastal flood hazard zones on Flood Insurance Rate Maps (FIRMs). The FIRM shows each community’s flood hazards and is an essential resource for participation in the National Flood Insurance Program (NFIP). The FIRM is used to determine who must buy flood insurance and where floodplain development regulations apply. FEMA is presently updating these maps updating these maps in order to more accurately reflect risk through an ongoing coastal flood hazard study for the New York/New Jersey coast. Prior to these recent revisions, the FIRMs had not been significantly updated since 1983. As a part of this process, FEMA has released a set of Preliminary Flood Insurance Rate Maps (pFIRMs). Eventually, the pFIRMs will be adopted as official Flood Insurance Rate Maps (FIRMs).

These maps define the 100- and 500- year flood zones as well as the Base Flood Elevations (BFE) for the 100 -year flood zone. The 100- and 500-year flood each reflect the probability (1 percent and .02 percent respectively) that Base Flood Elevations will be equaled to or exceeded in a given year in a given geography.

FEMA sets insurance rates and establishes building standards based on FIRMs and through the administration of the NFIP. The 100- year flood zone is the area where insurance and buildings requirements are regulated. The 100- and 500- year flood zones are also referred to as “A”-zones and “Shaded-X” zones. In addition to showing the 100- and 500- year flood zones, they also show the height to which the flood water in a 100- year flood event may rise. This is known as the Base Flood Elevation (BFE) and is referenced to the North American Vertical Datum of 1988 (NAVD88), a control for measuring vertical height consistently across the country. The BFEs guide acceptable resiliency measures (for example, the height to which a building must elevate) that comply with NFIP and buildings code requirements.

The process of updating these maps has resulted in an overall expansion of the flood zones and the maps now include upwards of 32,000 additional buildings city-wide. The updated maps also reflect higher Base Flood Elevations in many areas.

With respect to Red Hook, Map 5.3 shows the 100- year flood zone established by FEMA in 1983 and the extent to which storm surge as a result of Hurricane Sandy exceeded this geography. As shown, the flood waters reached well beyond the expected extent of the 100-year flood. The revision to the FIRM established in 1983 is shown in Map 5.4. The 100 - year and 500- year flood zones established by the pFIRM are illustrated in Map 5.5. Maps 5.6 and 5.7 both show the Base Flood Elevations that have been established in the pFIRM in Red Hook. With respect to the Red Hook BOA Study Area, 503 buildings are presently captured in the 100-year flood zone. As only 436 buildings were included in the 1983 FIRMs, this indicates a substantial increase (67 buildings) as result of the FEMA’s revisions to these maps. Based on these new maps, 91 percent of the Red Hook BOA is in the 100- year flood zone.

Since this BOA is largely focused on an industrial area, the implications of NFIP reform and the new FIRMs are different than residential areas. According to FEMA:  
*“If your commercial property is in a high-risk flood area and you have a mortgage from a federally regulated or insured lender, you are required to purchase a flood insurance policy.”*

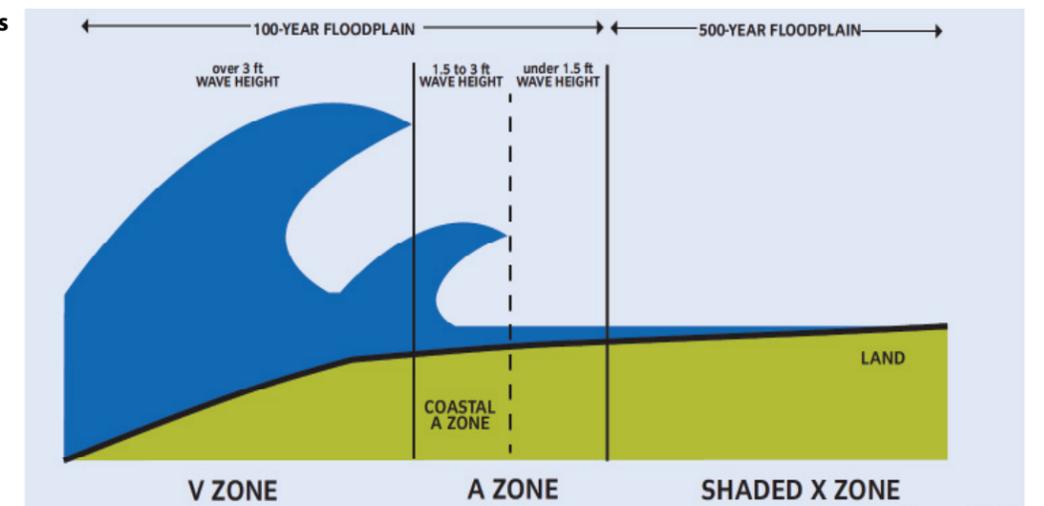
As these maps ultimately mandate the purchase of flood insurance, their revisions may have significant impacts on existing and prospective businesses and homeowners in Red Hook. Businesses often choose to purchase private insurance outside of the NFIP in order to attain more expansive coverage. The full implications of these revisions related to insurance coverage and cost are still under question and have resulted in uncertainty among property owners in Red Hook.

Should flood insurance premiums increase significantly as a result of the move to actuarially sound premium rates (as called for by Biggert-Waters), businesses and homeowners may face new or worsening challenges related to insurance costs. Typically, property owners who must purchase flood insurance have three options to qualify for lower premiums regardless of if they purchase private insurance or participate in the NFIP: (1) elevate the building above the BFE, (2) “wet flood proof” by enabling a “water in, water out” structure that is allowed to flood, or (3) “dry flood proof” by installing a barrier or gate to prevent water from reaching the inside of the building. These options are recognized based on building type and construction, its use, and its location in the flood zone. In Red Hook, it may be cost prohibitive and/or structurally infeasible to elevate or retrofit a large industrial building or warehouse to accommodate these standards.

In Red Hook, many business owners lease space from a building owner. In this case, the business owner (the lessee) is exempt from the mandated purchase of insurance but may choose to independently insure inventory and equipment within the building itself. However, in this case, plans such as elevating inventory in anticipation of a flood may not be adequate in reducing premiums for business owners. Should the building owner be required to purchase flood insurance and is impacted by rising premiums, the burden of this added cost may also be felt by the lessee.

Should a building be owned outright, without a federally-backed mortgage, the owner may still choose to independently invest in resiliency measures to protect the building despite being exempt from compulsory purchase of flood insurance. The additional cost associated with owning property and doing business in a high risk area such as Red Hook may be more than they are able or willing to absorb.

Figure 5.1 FEMA Flood Zones

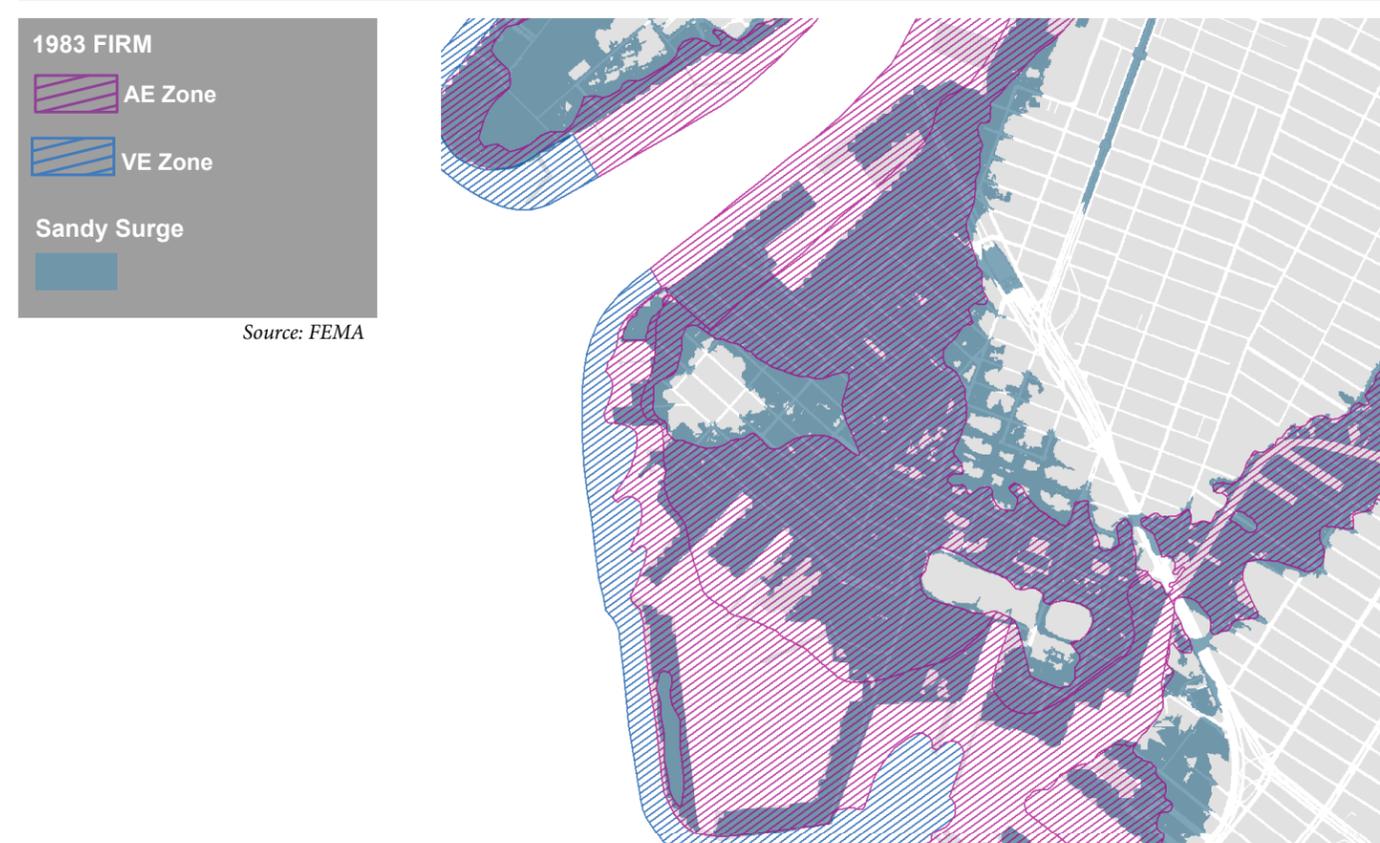


Source: FEMA

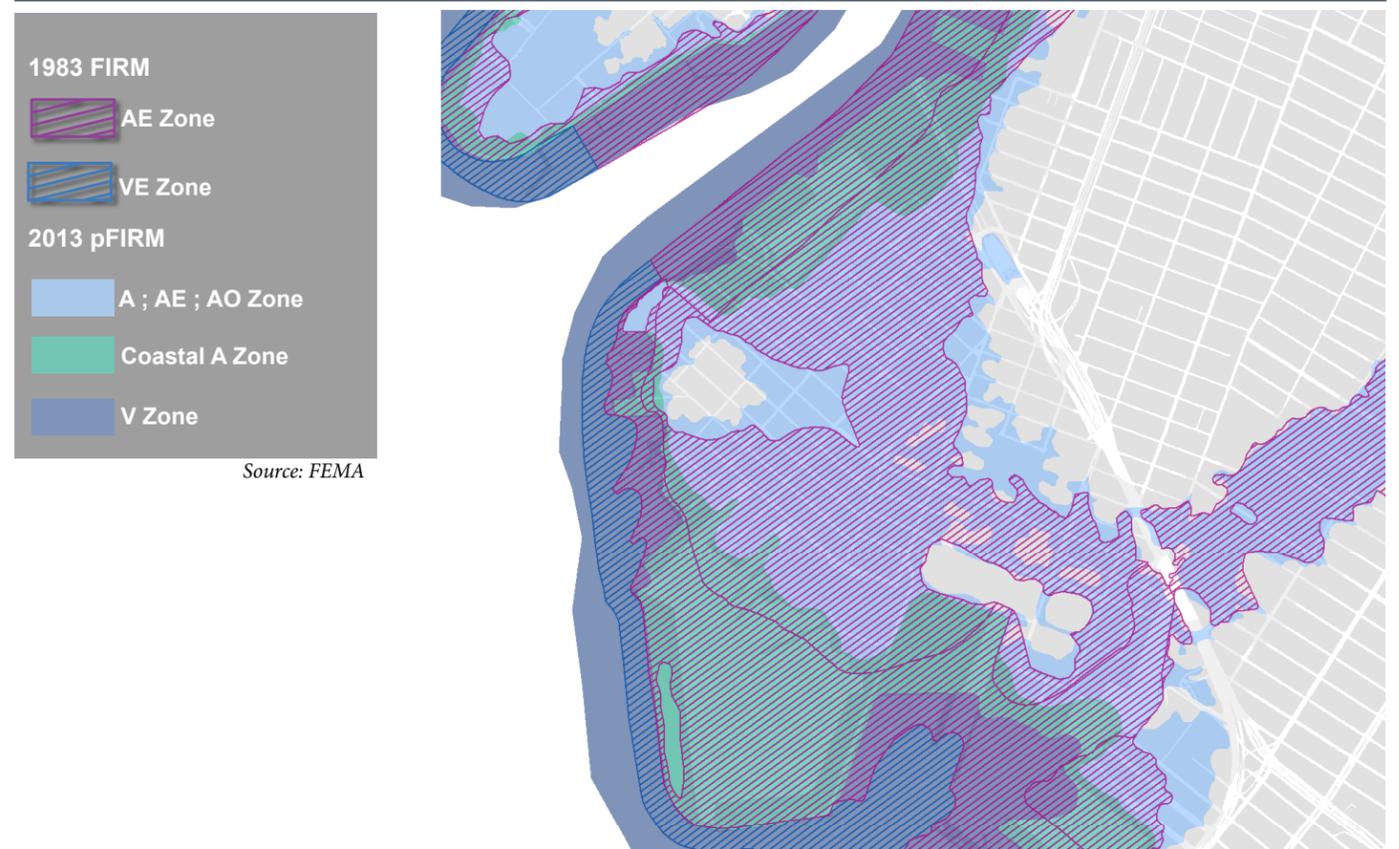
Map 5.2 Hurricane Sandy, Storm Surge Extent



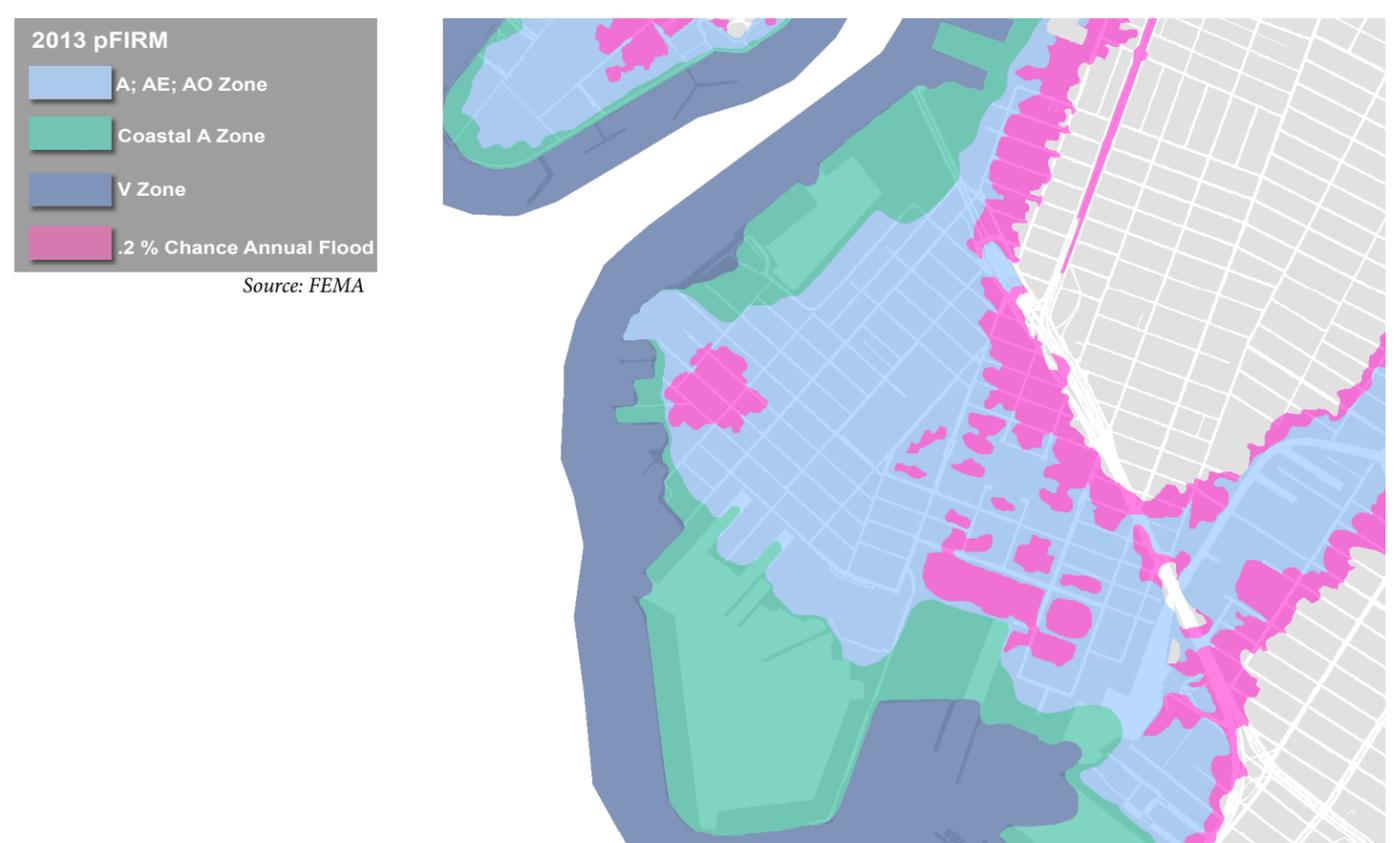
Map 5.3 1983 FIRM and Hurricane Sandy, Storm Surge Extent



Map 5.4 1983 FIRM and 2013 Preliminary - FIRM Flood Zones



Map 5.5 2013 Preliminary - FIRM Flood Zones

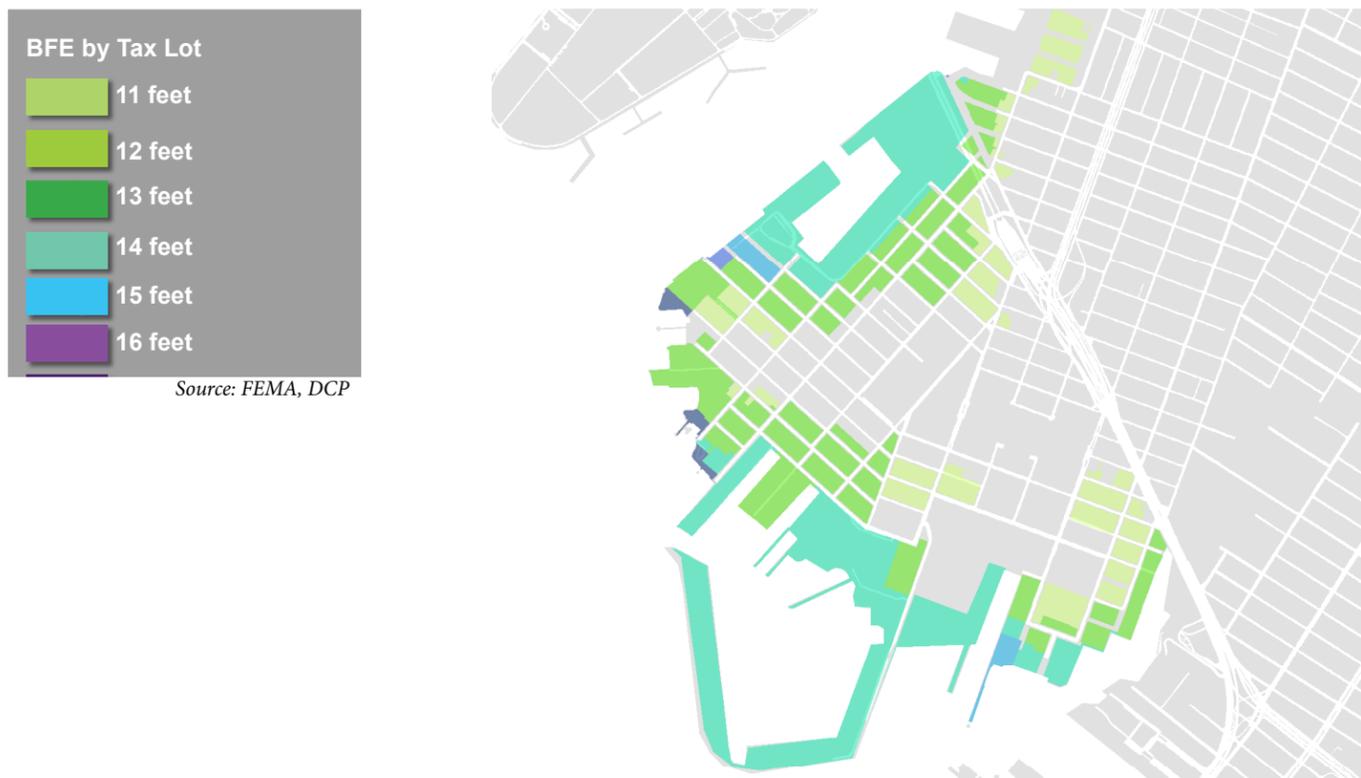


Map 5.6 Buildings and Base Flood Elevations



Source: FEMA

Map 5.7 Buildings and Base Flood Elevations By Lot



Source: FEMA, DCP

Note: In order to assign one flood zone per lot, a lot was assigned the flood zone with the stricter design guidelines (in order V, Coastal A, A, Shaded X) as long as 10 percent of its area falls within that flood zone. For example, if 11 percent of the lot fell within a V zone and the rest was in an A zone, it was assigned V zone since it has the stricter design guidelines and it reached the 10 percent threshold. The 10 percent criteria isn't based on any FEMA regulations.

## LOCAL POLICY CONTEXT

### Executive Order No. 230 and Intro 990

Issued on January 3, 2013, the Mayor's Emergency Executive Order No. 230 allows property owners to rebuild after Hurricane Sandy to meet updated FEMA flood standards in ways that may not comply with zoning or other regulations. This Executive Order suspended height and other restrictions to the extent necessary to rebuild to the latest flood-resistant standards. The Executive Order was by nature an interim measure. The Department of City Planning adopted the "Flood Resilience Text Amendment" to codify this action in October 2013.

Further, in November 2013, the Mayor signed into law Intro 990 thereby amending the Administrative Code of the City of New York and the New York City Building Code in relation to the use of best available flood maps. It allows the City to adopt the Preliminary Flood Insurance Rate Maps (pFIRMs) into the City's building code 30 days after they are released from FEMA. These maps will replace the Preliminary Work Maps as the best available flood hazard data for NYC.

### Flood Resilience Zoning Text Amendment

The Department of City Planning proposed a zoning text amendment to encourage flood-resilient building construction throughout designated flood zones. The amendment aimed to remove regulatory barriers that would hinder or prevent the reconstruction of storm-damaged properties and enables new and existing buildings to comply with new building standards and requirements. Building to these new standards will reduce vulnerability to future floods as well as help to avoid higher flood insurance premiums. This zoning text amendment, while outlining design standards for flood resiliency, is largely focused on one- and two-family residences, some commercial spaces, and parking. There is not yet the equivalent regulatory allowance specifically addressing manufacturing and industrial structures and operations; however, the Open Industrial Uses Study (OIUS), elaborated upon below, aims to address some of the flood resiliency issues that pertain to industrial facilities. On October 9, 2013 this zoning action was approved by the City Council.

### Open Industrial Uses Study (OIUS)

Discussed in depth in the "Local Planning and Policy Context" section of this report, OIUS is cited as "Initiative 1" in the NYC report, "A Stronger, More Resilient New York," Environmental Protection and Remediation Chapter, the Open Industrial Uses Study addresses open uses such as scrap yards that do not provide adequate environmental controls, create objectionable influences on neighboring businesses and residents, and pollute the city's soil, air, and waterways. Given the large number of open industrial properties in the 100-year flood zone, this study identifies cost-effective measures to safeguard exposed substances in flood zones.

With respect to flood vulnerability and resiliency, the zoning proposal also supports complementary code amendments to the Building Code that specify flood hazard mitigation requirements for open industrial uses such as a maximum fence height requirement. This study and actions associated with the recommendations discussed above will support the working waterfront in Red Hook by controlling for contamination of hazardous materials in light of the increased risks of flooding, and supporting the climate resiliency of Red

## FIELD SURVEY

The Department of City Planning conducted field work in order to begin measuring the vulnerabilities of buildings in the manufacturing districts of Red Hook. Execution of the survey took place over two days in July, 2013. Surveyors are credited at the end of this document. The findings of this survey, presented here, highlight the complexity of assessing flood vulnerability in light of an evolving regulatory environment. This survey identified factors including the estimated elevation of the lowest entry to the building, the presence of a “below-grade space”, the presence of open or closed industrial uses, and building typology and use of structures. Data collected as a part of this study may ultimately guide discussion about development and resiliency potential in Red Hook and on BOA strategic sites.

### Methodology

DCP surveyed buildings on tax lots in the Red Hook BOA Study Area and documented their conditions. In some cases, there were multiple buildings on a tax lot. Therefore, there were more “records” (any survey entry documenting the conditions of an individual building or lot with no building) than tax lots. In total, DCP surveyors documented 784 records. These 784 records are analyzed in this chapter. As mentioned above, 91% of the buildings in the Red Hook BOA are located in the 100-year flood zone. This highlights the high-level risk that many properties face. Features that were recorded in this survey included building type and use, observable sale or lease signage, the visibility of open industrial uses, and the observable presence of a below-grade space (including a basement or cellar). Below-grade spaces that were observed to be residential units were also noted. Analysis of the field survey results included assignment of a “predominant ground floor use,” in order to indicate what might be compromised in the event of a flood. In addition, surveyors also estimated the elevation of the lowest door or entry-way above the ground or sidewalk. The survey sheet is appended at the end of this document.

The above-listed survey points were chosen based on the vulnerabilities to flood events and potential for challenges given possible increases in flood insurance rates and evolving regulatory controls in Red Hook and other flood zones. Careful consideration was given to the elevations of entry-ways of buildings, as options can be limited in terms of flood proofing measures that qualify the insured for lower premiums. Typically, property owners who must purchase flood insurance have three options to qualify for lower premiums: (1) elevate the building above the BFE, (2) “wet flood proof” by enabling a “water in, water out” structure that is allowed to flood, or (3) “dry flood proof” by installing a barrier or gate to prevent water from reaching the inside of the building. These methods can pose unique challenges for urban buildings and may only be effective in reducing insurance costs depending on a building’s typology and construction, use, and location within the flood zone. Specifically, it may be cost prohibitive as well as structurally infeasible to elevate or retrofit a large industrial building or warehouse for flood vents. Elevating these types of structures may also pose challenges where general operations, materials storage, shipping activities, or machinery operations are infeasible when not on the ground-level. Further, many of the buildings in Red Hook are vulnerable to flooding well above the 3-4 foot threshold that dry flood proofing methods typically protect against (refer to Map 5.9).

This survey documented the presence of below-grade spaces and below-grade residential units. In some cases, for a building to qualify for affordable flood insurance, these spaces must be rendered uninhabitable. This may result in a building owner filling them in entirely where elevating the building and wet flood proofing is impossible, undesirable, or infeasible.

The presence of visible open industrial uses was recorded as a part of this field survey. This did not include any sites that were used exclusively for automotive purposes or parking, as this was recorded in a separate category. Open industrial uses included activities such as active and uncontained industrial operations, open storage of materials, or waste treatment and processing.

Building use was also noted in order to better understand the types of businesses, materials, and operations that are most likely to suffer from rising flood insurance rates and flood events. From an economic development standpoint, land use may indicate future challenges for development or current and prospective firms considering operations located in Red Hook. Particularly in industrial buildings in the Red Hook BOA, large machinery, open storage of materials, and large amounts of supplies and inventory may all be at risk. Any changes in land use regulation in M-zones to accommodate for flood risk will affect these activities.

Several blocks were excluded from the analysis of the field survey results in order to mitigate any potential skew that very large and dominating neighborhood features may have on the results. These properties do not represent the typical built form in the Red Hook BOA. These blocks include the grain terminal, the blocks and lots occupied by the Brooklyn Container Terminal and the Brooklyn Cruise Terminal, Fairway Supermarket, and IKEA. These sites are shown in Map 5.8 (Field Study: Area Boundaries and Excluded Sites map). While these buildings and businesses are indeed vulnerable to flood events, their relative ability to cope with future storm events and the impact of rising flood insurance rates is unique when compared with the smaller scale businesses and operations in Red Hook.

Map 5.8 Field Study : Area Boundaries and Excluded Sites

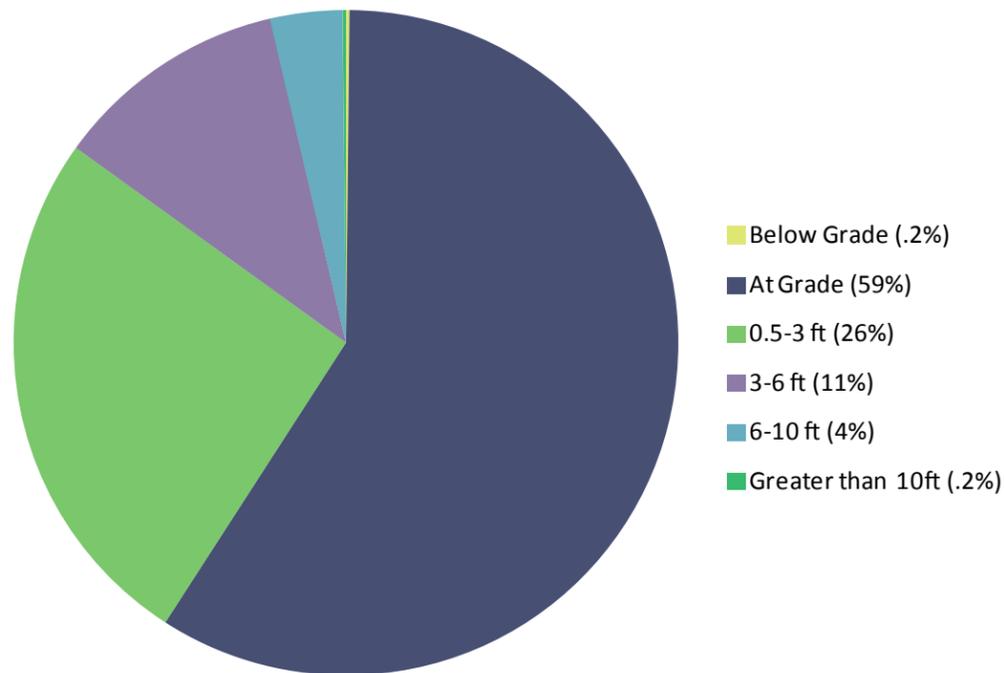


## Field Survey Results

All of the height estimations for entry-ways of buildings were made with respect to the sidewalk. For example, a building entrance identified as “At Grade” refers to an entry-way that is flush with the sidewalk. Since ground elevation varies across the flood zone, different “At Grade” entries may have different flood risks. Later in this report, the difference between the ground elevation above sea-level and the flood-elevation (BFE) is presented.

Based on the field survey, nearly half of the records in the Study Area have entry-ways that were recorded “At Grade.” 21 percent of observed were in the range of .5 to 3 feet above grade. In the event of the 100-year flood, these properties are at significant risk of substantial flooding. These results indicate that over three-quarters of records are at a significant risk in the 100-year flood event. The buildings with entry-ways estimated to be less than 6 feet above grade face major challenges in terms of flood proofing and thus qualifying for lower flood insurance premiums (should they have flood insurance). Almost 20 percent of the surveyed records have no building on the lot. Excluding these records, 96 percent of buildings have entry-ways below 6 feet above grade (Figure 5.2). Discounting surveyed records with no building, 59 percent were recorded as “At Grade”, nearly 26 percent were recorded between .5 and 3 feet, and over 11 percent were recorded between 3 and 6 feet above grade.

**Figure 5.2 Estimated Entry-ways of Buildings**  
\*Excludes properties without buildings



## Building Elevations

Of all the records, 37 percent were recorded as automotive, industrial, or warehousing. The estimated lowest elevations of these buildings’ entry-ways were overwhelmingly at grade. Given the generally low elevation of land in Red Hook, positioning at grade indicates significant risk of flooding.

**Table 5.1 Entry-ways of Automotive Sites**

Height Estimation Above Grade	Number of Buildings	Percent of Total Auto Sites
Below Grade	1	2%
At Grade	35	76%
0.5 - 3 feet	7	15%
6 - 10 feet	3	7%
<b>Total</b>	<b>46</b>	<b>100%</b>

**Table 5.2 Entry-ways of Industrial Sites**

Height Estimation Above Grade	Number of Buildings	Percent of Total Auto Sites
At Grade	166	85%
0.5-3 ft	21	11%
3-6 ft	3	2%
6-10 ft	3	2%
Greater than 10ft	1	1%
No Building	1	1%
<b>Total</b>	<b>195</b>	<b>100%</b>

**Table 5.3 Entry-ways of Warehouse Sites**

Height Estimation Above Grade	Number of Buildings	Percent of Total Auto Sites
At Grade	41	85%
0.5-3 ft	5	10%
3-6 ft	2	4%
<b>Total</b>	<b>48</b>	<b>100%</b>



Example of Warehouse, At Grade



Example of Industrial, At Grade

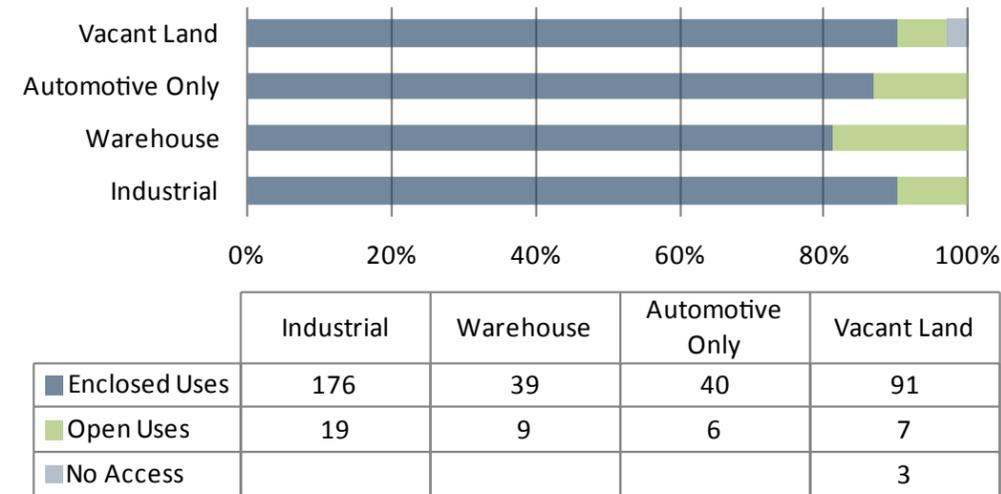
## Open Industrial Uses

From both an economic development and environmental standpoint, the presence of open industrial uses is of concern in flood prone areas as they increase the risk of loss of inventory, materials, and machinery, as well as the risk of cross-contamination of hazardous materials. This field survey documented the presence of open uses. Data collected indicates that open uses were mainly associated with warehouses, industrial buildings, automotive facilities, and vacant properties.

In total, 41 instances of open uses were recorded on sites that have land uses including industrial, warehousing, automotive, and vacant lots. Based on the field survey, several sites were classified as vacant (no built structure or organized use). However, on a handful of these sites open uses such as an informal junk yard or storage of construction materials were observed. As shown below in Figure 5.3, six percent of vacant lots have open uses; 13 percent of automotive sites have open uses; and 18 percent of warehouses have open uses. Of the 195 industrial sites, 19 have observable open uses (nearly 10 percent).

Based on this survey, approximately 10 percent of vacant, industrial, warehouse, and automotive sites (390 in total), have associated open uses. In Red Hook as a whole, approximately 5 percent of the 784 records have open industrial uses on site.

Figure 5.3 Open Industrial Uses



## LONG TERM IMPACTS

In Red Hook, FEMA calculates BFE to range from between 11 and 16 feet above sea level. Based on this data and the topographical elevation of land, the relative vulnerability of buildings in the BOA Study Area is identified in Map 28. Using the BFE and the known topographical elevation of the land above sea-level, both the impact of Hurricane Sandy and the potential for future flooding can be measured (Map 28). For example, where the ground elevation is 3 feet and the BFE is 11 feet, the anticipated flood depth is 8 feet.

In total, 91 percent of the Red Hook BOA Study Area is within the 100- year flood zone based on total lot area. Based on the difference between the BFE and the ground elevation, these properties, depending on their location within the flood zone, are at risk for up to 13.5 feet of flood inundation. Further, this data indicates that 76 percent of the Red Hook BOA (based on total lot area) would suffer from 3 feet or more of inundation. Within the BOA, 41 percent of all lots would suffer greater than 6 feet of inundation. Fewer than 15 percent of lots in the BOA can anticipate between 0 and 3 feet of flood inundation in the 100- year flood event. These ranges of inundation levels given this analysis are illustrated below in Map 28.

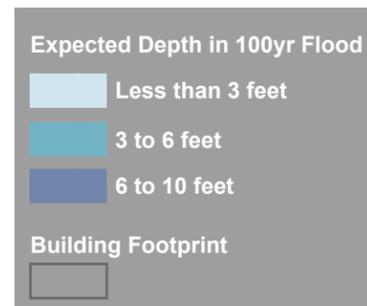
As discussed above, 96 percent of buildings have entry-ways below 6 feet indicating usable and potentially livable space below the BFE. Almost all of the buildings in Red Hook may face high premiums should they seek flood insurance coverage and not take steps to flood proof. Again, flood insurance is required of nearly all buildings in the 100-year flood zone that have a federally-backed mortgage. Given the challenges of flood proofing, the implications of this are severe for an area like Red Hook. Federal flood-resistant construction standards allow dry flood-proofing of industrial spaces, but in many cases it is cost prohibitive and unreliable when flood elevations are higher than 3 feet. With respect to rising costs associated with insurance premium reform, property owners may have to pay significantly more for flood insurance.

The field survey identifies risk posed to properties in Red Hook and validates the severity with which they may be impacted by rising flood insurance premiums or a choice to independently invest in resiliency measures. It does not consider tenants that may choose to insure inventory, materials, or machinery. Considering that industrial buildings and the operations that take place within them may not lend themselves to elevation, the future of Red Hook with respect to flooding is challenging. However, the recommendations made by the Open Industrial Uses Study spell out stricter regulatory controls on design and operations of industrial businesses in order to mitigate hazardous materials contamination in light of climate change and flooding. As such, these actions will aid in the resiliency of businesses in the flood zone in Red Hook.

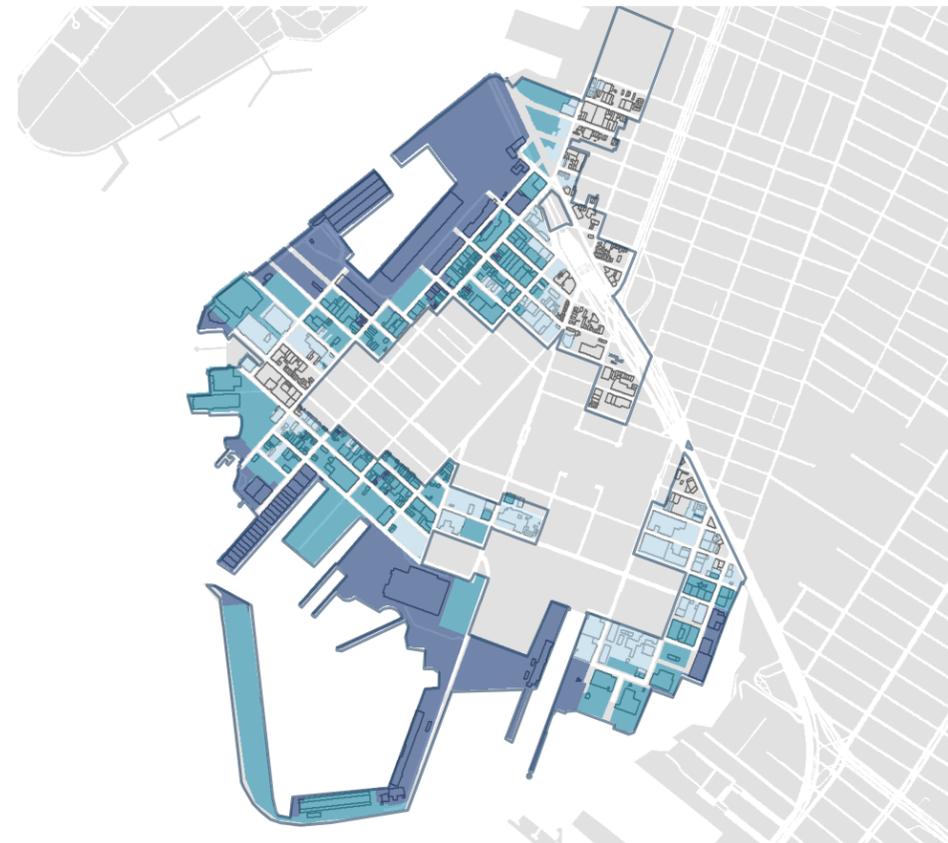
In addition to challenges posed by issues related to flood insurance, should repeated and intensified flooding occur as predicted, businesses that are unable to invest in flood resiliency measures may face repeated set-backs related to building repairs, interruptions in service and operations, and replacement of machinery, materials, and inventory. These issues are further complicated by the risk resulting from potential disruptions to transportation networks and infrastructure that make recovery from a flood even more difficult. As a result, some businesses may choose to relocate, may close, or may never reopen.

Further, while most of the commercial spaces along Van Brunt Street are not included in the Red Hook BOA Study Area and are subsequently left out of the field survey, it is worth mentioning that these businesses rely on foot traffic to their ground-floor store-fronts. Elevation of the lowest ground floor use challenges the viability of a business and complicates accessibility, while the cost of dry flood proofing the ground floor may be infeasible.

**Map 5.9 Expected Flood Depth By Lot**



Source: FEMA, DCP



Note: Based on Ground Elevation and Base Flood Elevation established by Preliminary Work Map of 100 Yr. Flood Zone

## FLOOD PROJECTIONS : 2020s and 2050s

In January 2013, the City reconvened the New York City Panel on Climate Change (NPCC), a body of leading climate and social scientists, to update its local climate projections to inform planning for rebuilding and resiliency post-Sandy. The NPCC updated its 2009 projections in a report called Climate Risk Information 2013. According to this report:

*"In response to the Mayor's charge to the Panel, this Report provides new climate change projections and future coastal flood risk maps for New York City. This climate risk information is designed to inform community rebuilding plans, and help to increase current and future resiliency of communities, and citywide systems and infrastructure to a range of climate risks."*

In addition to projecting and analyzing rising air temperatures and more frequent precipitation events, this panel also considered sea level rise and the likelihood of future frequency, extent, and height of coastal flooding. Below, Tables 5.5 and 5.6 display the results of the analyses done by the NPCC, categorized in terms of city-wide flood risk and potential sea level rise.

The analysis of future flooding also included the development of maps displaying future coastal flood risk. The estimated potential sea level rise was mapped to incorporate the FEMA 2013 Preliminary Work Maps described and displayed in detail earlier in this report. These maps illustrate risk of the combined sea level rise with the 100- and 500- year flood zones but do not account for other climate change impacts, such as storm intensity and frequency, that may also affect storm surge. Using this data, the following maps depict the future 100- and 500- year flood zones in Red Hook for the 2020s and 2050s. As previously discussed, the 100- and 500- year flood zone each reflect the probability (1 percent and .02 percent respectively) that Base Flood Elevations will be equaled to or exceeded in a given year. The 100- and 500- year flood zones are the geographic areas where each level of risk is mapped. The 100- year flood zone is the area where insurance and buildings requirements are regulated. This concept is explored earlier in this report. It is clear from these projections that by the 2050s, nearly every block in Red Hook will be in the 100-year flood zone, and the few pockets that have until now been spared will be at the same level of risk as the rest of the peninsula (Maps 5.10 and 5.11) Both the 100- and 500- year flood zones will be significantly expanded as sea levels continue to rise and the frequency of storms and the resulting storm surge continue to intensify.

**Table 5.4 Coastal Floods at the Battery**  
Source: NPCC

	2020s				2050s		
	Baseline (1971-2000)	Low-estimate	Middle range	High-estimate	Low-estimate	Middle range	High-estimate
Annual Chance of today's 100-year-flood	1.0%	1.1%	1.2 to 1.5 %	1.7%	1.4%	.7 to 3.2%	5.0%
Flood heights associated with 100-year-flood in feet (still-water + wave heights)	15.0	15.2	15.3 to 15.7	15.8	15.6	15.9 to 17	17.6

**Table 5.5 Sea Level Rise**  
Baseline (2000 - 2004)  
0 Inches  
Source: NPCC

	Low- estimate	Middle range	High- estimate
2020s	2 inches	4 - 8 inches	11 inches
2050s	7 inches	11 - 24 inches	31 inches

Note: Low Estimate = 10th percentile ; Middle Range = 25th to 75th percentile ; High-estimate= 90th percentile

Map 5.10 NPCC Flood Projections : 100 Year Flood plain



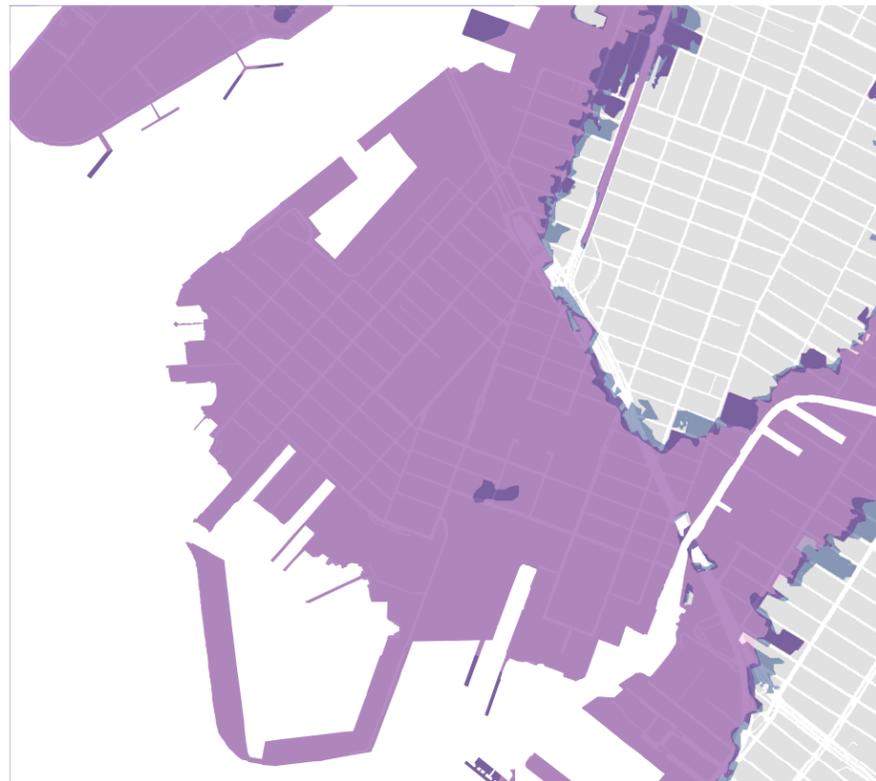
Source: NPCC



Map 5.11 NPCC Flood Projections : 500 Year Flood Plain



Source: NPCC



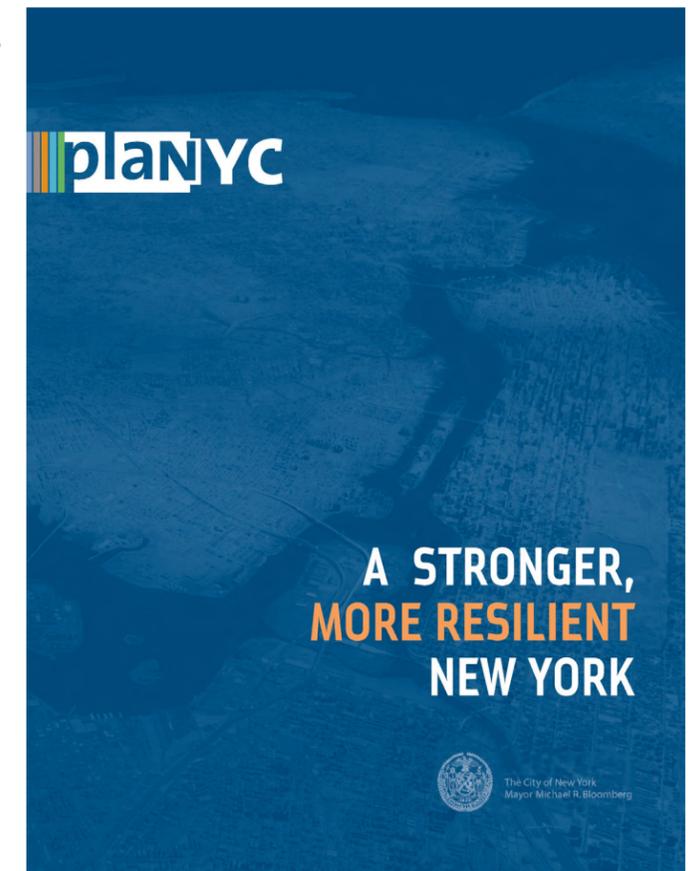
## A STRONGER MORE RESILIENT NEW YORK

In December 2012, Mayor Bloomberg created the Special Initiative for Rebuilding and Resiliency (SIRR) to address climate resiliency in New York City in the wake of Hurricane Sandy. In June 2013, “A Stronger, More Resilient New York” was released and offered recommendations both for recovery and rebuilding after Hurricane Sandy, as well as for the increased resiliency of New York City’s infrastructure and buildings.

The report outlines a variety of strategies and initiatives designed to make New York City more resilient. The projected total cost of all of these initiatives is estimated at approximately \$19.5 billion broken into short and long term expenditures. With respect to the plan outlined in the report, approximately \$14 billion is expected to cover both capital and study costs over a 10-year time period. The remaining costs are associated with projects and programs that are identified as worthy of study or that are proposed for completion beyond the 10-year time horizon of the plan. So far, \$10 billion worth of the plan is funded and \$5 billion is expected to be funded through federal aid and the City’s capital program. This leaves a funding gap of approximately \$4.5 billion. The City proposes to address this gap by both implementing the initiatives that can be covered by funds already in-hand and by identifying a basket of potential strategies that could close the funding gap.

Throughout the report, recommendations have been made that would affect Red Hook. Any citywide strategy that would impact Red Hook or any recommendation made with specific reference to Red Hook is identified here. These strategies are framed in terms of Coastal Protection, Buildings, Critical Infrastructure, and Community and Economic Recovery. Some initiatives have been funded and have entered into implementation phases, while others do not yet have any identified funding source. The initiatives outlined in this section are reproduced as they are written in “A Stronger, More Resilient New York”

Special Initiative for Rebuilding and Resiliency,  
“A Stronger, More Resilient New York”, 2013



# Comprehensive Coastal Protection Plan

Initiatives outlined in the Comprehensive Coastal Protection Plan are designed to increase coastal edge elevations, minimize upland wave zones, protect against storm surge, and improve coastal design and governance. Phase 1 Initiatives in this plan have been identified based on an analysis of risk factors including the likelihood of flooding, density of development, presence of critical infrastructure, and the presence of vulnerable populations. Priority areas and initiatives were identified based on this risk analysis. Phase 1 Initiatives were developed and are intended targets for initial investments. The remaining initiatives in the Comprehensive Coastal Protection plan that are not identified as Phase 1 are identified as "Full-Build Recommendations." Many of these initiatives will require partnerships among government entities including the United States Army Corps of Engineers (USACE).

**Phase I Initiative : Integrated Flood Protection System**

This recommendation, which calls for an Integrated Flood Protection System in Red Hook, is identified as one of 36 Phase 1 Initiatives outlined in the report's Comprehensive Coastal Protection Plan. The "Integrated Flood Protection System" will be composed of permanent features, temporary features, and landscaping and drainage improvements. This approach aims to mitigate the challenges that Red Hook faces with its low-lying topography, older building stock, and the density of industrial buildings and businesses with ground flood equipment that is difficult to elevate, a vulnerable commercial corridor, and a significant population that lacks the means to make resiliency investments.

This design approach, a schematic of which is displayed in Figure 5.4, would protect the neighborhood but would not interfere with neighborhood fabric during non-storm conditions. According to the report, the design will be selected following an international competition and "may include elevation of portions of the Brooklyn Waterfront Green-way. Other elements likely would run along the first mapped street inland of the waterfront throughout the neighborhood." The SIRR anticipates commencement of design in 2014 and construction completion by 2016. The renderings on the next page display a conceptual rendering of a potential Flood Protection System taken from the Brooklyn-Queens Waterfront Chapter of "A Stronger, More Resilient New York." Some funding has been allocated for this project by New York State and New York City, but as of the writing of this report, the design competition is still in planning stages.

**Full Build Initiative : Improved coastal protection measures using clean dredge**

The report recommended that the City, through NYC EDC, work with the Port Authority of New York and New Jersey to continue a study of innovative coastal protection measures using clean dredge material in Southwest Brooklyn. The work will explore in-water protection measures including a breakwater constructed from clean dredge materials, as well as the creation of an oyster habitat and wetlands within the Bay Ridge Flats, a shallow area offshore of Red Hook and Sunset Park. Efforts will be made by the NYS DEC and the US Coast Guard to minimize impacts on shipping and anchoring.

**Full Build Initiative : Local storm surge barrier along the Gowanus Canal**

This initiative calls on the United States Army Corps of Engineers, in coordination with the US Environmental Protection Agency, to complete preliminary designs for a local storm surge barrier at the mouth of the Gowanus Canal. According to the report, one potential location for the proposed barrier is across the Gowanus Bay from Erie Basin to 29th Street in Sunset Park. Such a barrier would be supported by a raised levee along both piers connected to natural high points, preventing flooding to properties near the barrier. The barrier would have the added benefit of creating a new storm water basin that could be used to facilitate drainage. The barrier is intended to be navigable to allow for continued shipping traffic along this working waterfront.

**Conceptual Rendering of Red Hook Flood Protection System**  
Non-storm conditions



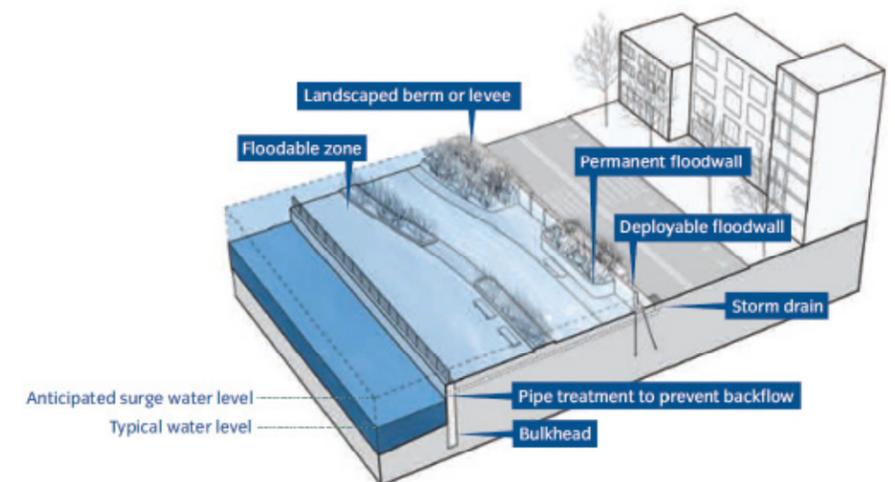
Pre-storm Conditions



Source: SIRR

**Figure 5.4 Integrated Flood Protection System**

Source: SIRR



## Buildings

**• Implement planned upgrades to vulnerable City-owned, industrial properties**

This initiative calls for investment in facility upgrades within the 100-year flood zone. In Red Hook, the Brooklyn Cruise Terminal is targeted for upgrades. The recommendations call for raising electrical equipment to newly created mezzanines and installing water-resistant floor materials.

**• Rebuild and repair housing units destroyed and substantially damaged by Sandy**

This initiative recommends that the City, through the Mayor's Office of Housing Recovery Operations (HRO), provide financial and other assistance to owners of residential properties that were destroyed or substantially damaged during Sandy.

**• Study and implement zoning changed to encourage retrofits of existing buildings and construction of new resilient buildings in the 100-year flood plain**

The City, through the Department of City Planning, will undertake a series of citywide and neighborhood-specific land use studies to address key planning issues in severely affected and vulnerable communities. The initiative also calls upon DCP to implement changes deemed appropriate based on the outcomes of these studies.

**• Retrofit public housing units damaged by Sandy and increase future resiliency of public housing**

This initiative calls on NYCHA to repair public housing developments that were damaged by Sandy, incorporating new flood resiliency measures. NYCHA will also undertake a planning process to identify additional resiliency investments in developments that are vulnerable to weather-related events, even if they were unaffected by Sandy.

**• Launch sales tax abatement program for flood resiliency in industrial buildings**

This initiative calls on the New York City Industrial Development Agency (NYC IDA) to launch a \$10 million program to provide incentives to owners of industrial buildings to encourage them to make resiliency investments in their buildings. The program will prioritize 1- to 2- story buildings with more than 4 feet between their actual ground elevation and the applicable BFEs.

## Critical Infrastructure

**• Improve connections between Red Hook and the rest of Brooklyn**

This recommendation calls for investments that would provide residents and visitors with quicker, safer, and more reliable transportation options, available during both emergency and every-day conditions. This initiative calls on the NYC department of transportation to create new connections between Red Hook and the rest of Brooklyn at Mill Street. Ultimately, this plan aims to shorten the bus trip between Red Hook Houses and the closest subway station.

**• Call for the MTA to explore Red Hook- Lower Manhattan bus connections**

This recommendations calls on the MTA to study bus routes from Red Hook to Lower Manhattan via the Hugh L. Carey Tunnel to support Red Hook residents who work in Lower Manhattan.

**• Reconstruct and resurface key streets damaged by Sandy**

This initiative calls on the NYC Department of Transportation to reconstruct 60 lane-miles of streets that were severely damaged by Sandy and repave approximately 500 lane-miles of streets with damaged surfaces.

**• Protect private ferry terminals from climate change-related threats**

This initiative calls for quicker restoration of service of ferry services and recommends that the City use Federal Transit Administration Emergency Relief funds to construct physical improvements to the floating infrastructure, loading bridges/gangways, pilings and piers at ferry landings around the city. The report states the NYC Department of Transportation will implement these recommendations.

**• Expand the network of bus priority lanes on arterials highways**

This initiative recommends that the NYC Department of Transportation and the New York State Department of Transportation and the Metropolitan Transit Authority implement 15 miles of bus priority corridors on major arterials highways, such as the Brooklyn-Queens Expressway and the Gowanus Expressway. This plan would improve roadway efficiency following an emergency.

**• Harden or otherwise modify shoreline parks to protect adjacent communities**

This initiative calls on the NYC Department of Parks and Recreation to study cost-effective ways to use the park system to protect adjacent vulnerable communities. In Red Hook, the Red Hook Recreational Area is identified as a target site for this study.

**• Harden pumping stations**

This initiative calls on the City, through the Department of Environmental Protection, to retrofit wastewater and storm water pumping stations. These retrofits include raising or flood-proofing critical equipment, constructing barriers, and installing backup power supplies. Among the pumping stations considered in the report for hardening, one is located in Red Hook.

## Community and Economic Recovery

### • Create and implement a revitalization strategy for targeted retail and community spaces within Red Hook Houses

This recommendation calls on a partnership between the New York City Housing Authority (NYCHA) and the New York City Economic Development Corporation to make capital improvements to NYCHA- controlled retail and community spaces. The initiative seeks to attract new retailers, create job opportunities for residents, and generate revenue for NYCHA. Investments are also intended to improve and/or expand facilities available to community organizations.

### • Call for Neighborhood Retail Recovery Program

This initiative calls for discounted Con Edison electric delivery for small businesses and nonprofits with 10 or fewer employees that have received support from City-sponsored loan and grant programs. These businesses will be eligible for the discount for five years and up to a maximum of \$50,000. In Red Hook, implementation is targeted in the Columbia Street Waterfront District, along Van Brunt Street (between Reed St. and Bowne St.), along Lorraine Street (between Dwight St. and Hicks St.), and Clinton Street (between Hamilton and Centre St.)

### • Support local merchants in improving and promoting local commercial corridors

This initiative calls on the City, through the Department of Small Business Services, to provide financial and/or technical assistance to area Business Improvement Districts (BIDs), merchant associations, and other groups that work to improve, market, maintain, and otherwise promote primary commercial corridors.

## FUTURE ENVIRONMENTAL IMPACT

The risks of flooding in Red Hook reach beyond potential structural damage to buildings and infrastructure. The potential migration of environmental contaminants is a concern in a flood zone. This complicated and diffuse risk threatens not only the viability of business operations, but also the many natural resources in and around Red Hook and the health and safety of residents. According to a report sponsored by the United States EPA:

*“Floods and flooding often result in widespread contamination that poses both immediate and long-term threats to human health and the environment. The environmental consequences of flooding, however, can be extremely complex and difficult to assess because of their large spatial extent, including multiple sources, sinks, and types of pollutants, and because of their potential effects on nearly all components of the environment.”<sup>xi</sup>*

As discussed previously in this report, the storage of petroleum and the presence of open spills (sites where New York State has documented the event of either a chemical or petroleum spill) is pervasive in Red Hook and heightens this risk of widespread contamination. Dangerous conditions can develop in the event of a flood as petroleum products can spill and leak into homes, soil resources, and surrounding water bodies from sources such as home heating oil tanks in basements as well as large industrial tanks. The NYS DEC suggests that owners of commercial and residential fuel oil tanks located in flood zones take precautions in preparation for future floods, including those stored underground and in basements. It also warns owners and operators to call for immediate inspection and interim remediation should a spill occur to minimize environmental contamination and risks to human health. Given the industrial nature of many businesses in Red Hook, there is a wide variety of hazardous materials that may spill in the event of a flood, including oil and petroleum, paints, and chemical compounds. If not safely stored, they may spill in a flood and further contaminate the soil and water resources in the area.

In Red Hook, the prevalence of historic and current uses that use hazardous materials indicates the strong possibility that contaminants may present a risk to future users. The surrounding properties, soil and land resources, and water bodies are also at risk because of their proximity in the event of a flood. The potential strategic sites profiled in the previous section highlight how the potential presence of contamination may hinder future development. The heightened risk of cross contamination caused by flooding, disturbing hazardous materials, compounds this challenge. Contamination may be significantly more widespread than what can be assumed based on site-specific historical research. Disturbing hazardous materials compounds this challenge.

Following Hurricane Sandy, the NYC Department of Environmental Protection conducted inspections of the facilities that had reported storage or presence of hazardous materials under Local Law 26 of 1988, known as the NYC Right-to-Know law. DEP did not find evidence of chemical spills on these sites. According to the report:

*“the lack of evidence may indicate that these impacted businesses had secured these chemicals sufficiently prior to Sandy or adequately remediated their sites post-storm, it also may reflect the particular reality of Sandy, as the high volume of water may have diluted and washed away any spills that occurred.”*

In the event of a flood, hazardous material may be present in flood waters, particularly in waterfront industrial areas like Red Hook. Flood waters can also carry raw sewage. In New York City, sewer infrastructure containing sewage can be overwhelmed by flood or rain water. The result can lead to an inability for a waste water treatment plant to process the total volume of combined sewage and storm or flood water directed to the facility. Some combined sewage then bypasses the plant and spills into local waterways. This is commonly called Combined Sewer Overflow (CSO).

"A Stronger, More Resilient New York" outlines seven initiatives intended to support the working waterfront, and support industrial resiliency in light of climate change and flood risk. These recommendations are identified in the Environmental Protection and Remediation Chapter as follows:

- **Identify cost-effective measures to safeguard exposed substances in the 100-year floodplain**
- **Develop a catalogue of best practices for storing enclosed hazardous substances in the 100-year flood plain**
- **Accelerate brownfield cleanup in the 100-year floodplain to prevent release of pollutants**
- **Explore strengthened cleanup standards on industrial waterfront brownfields**
- **Launch brownfield climate change resiliency audits and improve storm preparedness**
- **Launch full operation of the NYC Clean Soil Bank**
- **Perform update of SPEED, the City's online environmental research engine**

Any action taken by the city based on these initiatives may directly impact Red Hook given the extent to which it was flooded, the density of industrial businesses, and the potential for the spread of environmental contamination. Should the Southwest Brooklyn Industrial Development Corporation receive funding to carry out additional BOA work in Red Hook, the above-listed initiatives may be instrumental in future neighborhood planning and economic development.

## KEY FINDINGS AND NEXT STEPS

*The Southwest Brooklyn Industrial Development Corporation (SBIDC) has been awarded BOA funds by New York State. Red Hook, while inclusive of some residential districts in the center of the peninsula, is largely zoned for manufacturing uses along the waterfront. Apart from zoning, land use has long been guided by policies that promote industrial development such as the Southwest Brooklyn Industrial Business Zone (IBZ). Priorities for the study of Red Hook involved not only identifying existing conditions and strategic sites for redevelopment, but also discussing vulnerabilities to flooding and issues of resiliency.*

*While the BOA Study Area in Red Hook has long been used for manufacturing and industrial uses, there are indications that the neighborhood has begun to shift towards a wider variety of uses as well as signs of a heightened interest in development in the area. These developments include the introductions of the Fairway Supermarket, now an important anchor for neighborhood retail businesses; IKEA home furnishings, a regional destination made more accessible through the opening of ferry service between downtown Manhattan and Red Hook; and increased public access to the waterfront along the Columbia Street Esplanade and Erie Basin Park. Other important activities in the area include the Superfund designation by the United States EPA of the Gowanus Canal and its ongoing cleanup as well the expressed interest in development of the Sugar Refinery site and the Red Hook Grain Terminal site by Joe Sitt and John Quadrozzi respectively.*

*Issues of contamination are complicated by the growing risk and concern of severe coastal flooding and point to uncertainty for existing and prospective development interests as well as businesses and residents. Further, as a result of historical industrial and manufacturing activities in this area, environmental contamination is a potential barrier to investment. A long history of spills, petroleum storage, junk storage, automotive uses, manufacturing, and widespread use of a variety of hazardous materials raise the possibility of widespread contamination. These conditions may significantly impact the redevelopment of vacant sites and underutilized properties in Red Hook. However, the Mayor's Office of Environmental Remediation has established a wide variety of programs to help land owners and developers overcome the impediments caused by environmental contamination and enable redevelopment.*

*These issues highlight the need for an organized and comprehensive approach to future planning in Red Hook, making this an opportune time for continued BOA work. This study is an opening for community input and aims to provide support for community dialogue. This dialogue will ultimately shape a vision for the neighborhood and goals for future development. BOA and the series of supporting programs established by the Mayor's Office aim to open up opportunities to support growth in the neighborhood by promoting more efficient use of land, addressing the area's vulnerability to flooding, addressing the presence of many vacant and underutilized properties, and supporting the remediation of environmental contamination.*

*As part of this study, outreach to SBIDC was made to better understand the local perception of development issues and gauge capacity for redevelopment within the community. Moving forward, SBIDC expects to develop a community participation strategy and carry out community engagement activities for Step 2 of the BOA.*



**APPENDIX**  
*SOURCES*

*DIGITAL TAX MAP*

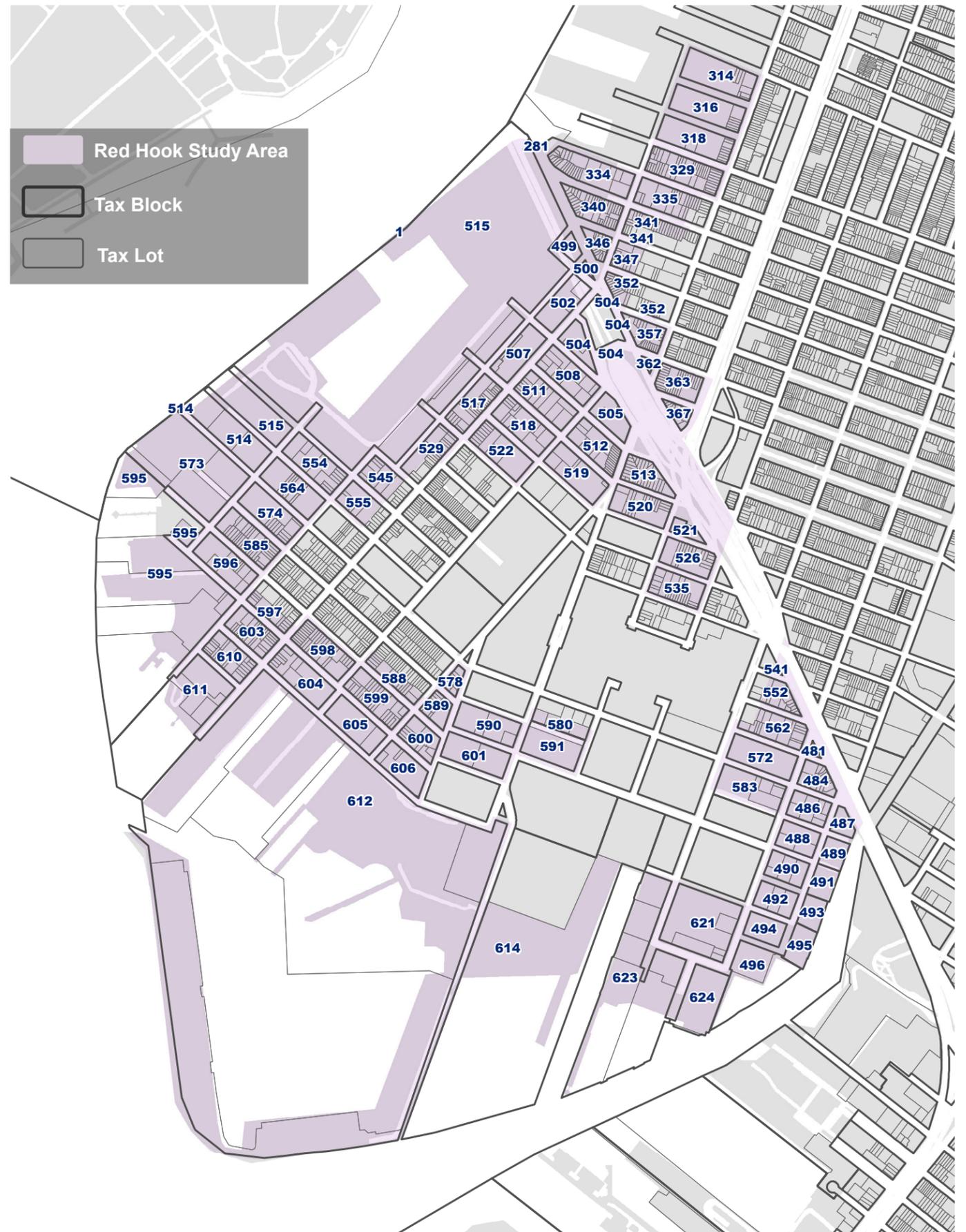
*MAPS, TABLES, and FIGURES*

*GLOSSARY OF DATA SOURCES, TERMS, and ORGANIZATIONS*

*FIELD SURVEY MATERIALS*

*CEQR HAZARDOUS MATERIALS APPENDIX*

# DIGITAL TAX MAP



Source: DCP, DTM

## SOURCES

- i. Tidal Wetlands. (n.d.). *NYS Dept. of Environmental Conservation*. Retrieved February 28, 2014, from <http://www.dec.ny.gov/lands/4940.html>
- ii. Tidal Wetlands Categories. (n.d.). *NYS Dept. of Environmental Conservation*. Retrieved February 28, 2014, from <http://www.dec.ny.gov/lands/5120.html>
- iii. Whale Songs in the City. (n.d.). *National Resources Defense Council*. Retrieved February 28, 2014, from <http://www.nrdc.org/wildlife/marine/nywhales/nywhales.asp>
- iv. National Wetlands Inventory. (n.d.). *United States Fish and Wildlife Service*. Retrieved February 28, 2014, from <http://www.fws.gov/wetlands/>
- v. Atlantic Ocean/Long Island Sound Watershed Map. (n.d.). *NYS Dept. of Environmental Conservation*. Retrieved February 28, 2014, from <http://www.dec.ny.gov/lands/53733.html>
- vi. CrimeStat. (2014, February 16). *Police Department of the City of New York*. Retrieved February 16, 2014, from [http://www.nyc.gov/html/nypd/downloads/pdf/crime\\_statistics/cs076pct.pdf](http://www.nyc.gov/html/nypd/downloads/pdf/crime_statistics/cs076pct.pdf)
- vii. NYC Industrial Business Zones. (n.d.). *New York City Economic Development Corporation*. Retrieved February 28, 2014, from <http://www.nycedc.com/industry/industrial/industrial-business-zones>
- viii. Brownfield Cleanup Program. (n.d.). *Empire State Development*. Retrieved February 28, 2014, from <http://esd.ny.gov/businessprograms/brownfieldcleanup.html>
- ix. New York City's Wastewater Treatment System. (n.d.). *New York City Department of Environmental Protection*. Retrieved February 28, 2014, from <http://www.nyc.gov/html/dep/html/wastewater/wwsystem-plants.shtml>
- x. Red Hook Recreation Area. (n.d.). *New York City Department of Parks and Recreation*. Retrieved February 28, 2014, from <http://www.nycgovparks.org/parks/redhookpark/history>
- xi. Tilotta, David C. , Kozliak, Eugene , Pyle, Sally J. (2003.) *Environmental Contamination as a Result of Flooding: A Case Study of Heating Oil Pollution in the Red River Valley*. Retrieved from the United States Environmental Protection Agency website: <http://cfpub.epa.gov/ncer/abstracts/index.cfm/fuseaction/display.abstractDetail/abstract/6061>

MAPS, TABLES, and FIGURES

*Maps*

- Map 1.1 Community Context ..... 10
- Map 1.2 Water Resources and Topography.....12
- Map 1.3 Year Built.....15
- Map 1.4 Historic and Current Shoreline.....16
- Map 1.5 BOA Study Area and Local Roadways.....17
- Map 1.6 Historic and Current Zoning Regulations .....19
- Map 1.7 Southwest Brooklyn Industrial Business Zone.....21
- Map 1.8 Significant Marine and Industrial Area, Priority Marine Activity Zones, and Coastal Zone.....21
- Map 1.9 Land Use.....24
- Map 1.11 Public Transportation Network .....29
- Map 1.12 Parks, Open Spaces, and Street Trees.....32
- Map 2.1 Demographic Study Area.....34
- Map 2.2 Population Density .....34
- Map 4.1 Strategic Sites.....54
- Map 5.1 Evacuation Zones.....89
- Map 5.2 Hurricane Sandy, Storm Surge Extent .....96
- Map 5.3 1983 FIRM and Hurricane Sandy, Storm Surge Extent.....96
- Map 5.4 1983 FIRM and 2013 Preliminary - FIRM Flood Zones.....97
- Map 5.5 2013 Preliminary - FIRM Flood Zones.....97
- Map 5.6 Buildings and Base Flood Elevations.....98
- Map 5.7 Buildings and Base Flood Elevations By Lot.....98
- Map 5.8 Field Study : Area Boundaries and Excluded Sites .....101
- Map 5.9 Expected Flood Depth By Lot.....106
- Map 5.10 NPCC Flood Projections : 100 Year Flood plain.....108
- Map 5.11 NPCC Flood Projections : 500 Year Flood Plain.....108

*Tables*

- Table 1.1 Zoning District.....18
- Table 1.2. Comparative Land Use.....24
- Table 1.3 Land Use in Red Hook.....25
- Table 2.1 Racial Demographics.....35
- Table 2.2 Economic Characteristics.....37
- Table 2.3 Employment and Firms, 2000 - 2011.....40
- Table 4.1 State Funded Remediation.....51
- Table 4.2 Federally Funded Remediation.....52
- Table 4.3 Strategic Site Summary Table.....55
- Table 5.1 Entry-ways of Automotive Sites.....103
- Table 5.2 Entry-ways of Industrial Sites.....103
- Table 5.3 Entry-ways of Warehouse Sites.....103
- Table 5.4 Coastal Floods at the Battery.....107

*Figures*

- Figure 1.1 Land Uses by Percent Total Lot Area in Red Hook [top].....25
- Figure 1.2 Land Uses by Percent Total Lot Area in Red Hook [bottom].....25
- Figure 1.3 Housing Occupancy.....26
- Figure 1.4 Housing Tenure.....26
- Figure 2.2 Residential Age Distribution.....36
- Figure 2.3 Educational Attainment.....36
- Figure 2.4 Employment by Industry and Unemployment.....38
- Figure 2.5 Percent Total Firms [top].....40
- Figure 2.6 Percent Total Employees[bottom].....40
- Figure 5.1 FEMA Flood Zones.....95
- Figure 5.2 Estimated Entry-ways of Buildings.....102
- Figure 5.3 Open Industrial Uses.....104
- Figure 5.4 Integrated Flood Protection System.....111

## GLOSSARY OF DATA SOURCES and ACRONYMS

## GLOSSARY OF DATA SOURCES

### **100 – Year flood plain and Special Flood Hazard Areas (SFHAs)**

The 1 percent annual chance flood is also referred to as the base flood or 100-year flood (or flood plain). This is also known as a Special Flood Hazard Area (SFHA). SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

### **500 - Year flood plain**

The .02 percent annual chance flood is also referred to as the 500 -year flood (or flood plain).

### **A Zone**

Zone A is comprised of the area subject to storm surge flooding from the 1% annual chance coastal flood. These areas are not subject to high velocity wave action but are still considered high risk flooding areas.

### **The American Community Survey (ACS)**

The American Community Survey (ACS) is an ongoing survey that provides data every year -- giving communities the current information they need to plan investments and services. The American Community Survey includes questions that are not asked by the 2010 Census, and the two serve different purposes.

### **B Base Flood Elevation (BFE)**

The base flood is the national regulatory standard used by the National Flood Insurance Program (NFIP) and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. The Base Flood Elevation (BFE) is the elevation shown on the Flood Insurance Rate Map (FIRM) for Zones AE, AH, A1-30, or VE that indicates the water surface elevation resulting from a flood that has a 1-percent chance of occurring in any given year.

### **C Chemical Bulk Storage (CBS)**

The NYS CBS program regulates aboveground storage tanks with a capacity of 185 gallons or more, all underground storage tanks regardless of capacity, and all non-stationary tanks.

### **Coastal A / AE**

Coastal A / AE: The portion of the Special Flood Hazard Area landward of a V zone (i.e., areas where wave heights are computed as less than 3 feet) that is mapped as an A or AE zone on the FIRM. While the wave forces in coastal A zones are not as severe as those in V zones, the capacity for the damage or destruction of buildings is still present.

### **F Flood Insurance Rate Maps (FIRMs)**

FIRMs are the official map of a community on which FEMA has delineated the 1% annual chance (base) floodplain or Special Flood Hazard Area, the Base Flood Elevations (BFEs), and the risk premium zones applicable to the community. The FIRM is used to determine who must buy flood insurance and where floodplain development regulations apply. Once effective, FIRMs are available through the local community map repository and online.

### **N New York City E-Designation**

Changes in zoning are subject to an environmental review pursuant to state and local law. An (E) designation is a zoning map designation that provides notice of the presence of an environmental assessment requirement pertaining to potential hazardous materials contamination, noise or air quality impacts on a particular tax lot where new construction or land use change is planned.

**New York City Vacant Fill Property database**

Vacant Fill Properties (VFP) are vacant, privately-owned properties that have evidence of historic fill. Vacancy status, signifying the lack of structure or use on site, is determined by NYC Department of Finance assessment.

**New York Panel on Climate Change Flood and Climate Projections**

New York City on Climate Change (NPCC), a body of leading climate and social scientists, has updated its 2009 projections in a report called *Climate Risk Information 2013* in order to inform planning for rebuilding and resiliency post-Sandy. The NPCC

**New York State Bulk Storage Program**

Tanks storing petroleum and hazardous chemicals must meet minimum standards established by the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (DEC). New York's Hazardous Substances Bulk Storage Program (including Petroleum Bulk Storage and Chemical Bulk Storage programs) provides guidelines and controls for the storage of many different hazardous chemicals including petroleum products.

**New York State Major Oil Storage Facility (MOSF)**

The MOSF program regulates tanks and vessels at petroleum storage facilities with a cumulative capacity of 400,000 gallons or more.

**New York State Resource Conservation and Recovery Act Facilities (RCRA)**

The Resource Conservation and Recovery Act Program addresses adverse impacts to human health and the environment that are discovered as a result of unsafe waste handling and disposal practices.

**New York State Solid Waste Facilities**

Solid waste facilities are sites listed on NYSDEC solid waste database and may include landfills or solid waste transfer stations.

**New York State Spill Incidents Database**

A "spill" is an accidental or intentional release of petroleum or other hazardous materials. The database records spill incidents, including such information as material spilled, resource affected, amount spilled in gallons or pounds, and the name of water body affected by spill.

**North American Vertical Datum of 1988 (NAVD88)**

A datum is a vertical plane from which surveyors measure elevations. The North American Vertical Datum of 1988 (NAVD88) is the standard vertical datum used by the federal government for mapping projects.

**NYC Department of Buildings**

The Department of Buildings maintains records of all construction activity, job filings, violations, complaints and certificates of occupancy for a particular address.

**P Petroleum Bulk Storage (PBS)**

The NYS Petroleum Bulk storage Program regulates tanks at facilities with a cumulative storage capacity of more than 1,000 gallons.

**Preliminary Flood Insurance Rate Maps (pFIRMs)**

A FIRM that is not yet effective that reflects the initial results of a flood map project performed by or for FEMA. The Preliminary FIRM (pFIRMs) is provided to the Chief Executive Officer (e.g., Mayor, County Commissioner, etc.) and floodplain administrator for each affected community and is available to all citizens for review both online or through the local community map repository (often the community planning or zoning office).

**Preliminary Work Maps (PWFMs)**

The preliminary work maps created for certain New Jersey/New York communities are an interim product created by FEMA in the development of preliminary Flood Insurance Rate Maps (FIRMs). The preliminary work maps reflect the full results of an ongoing coastal flood hazard study for the New York/New Jersey coast.

**Primary Land Use Tax Lot Output (PLUTO)**

Primary Land Use Tax Lot Output (PLUTO) represents a compilation of data from the Department of Finance and the Department of City Planning. It includes primary tax lot and building characteristics such as land use, ownership, year built, number of units, lot and building size, allowable and built floor area ratio (FAR), and the presence of historic districts or landmarks.

**Q The Quarterly Census of Employment and Wages (QCEW)**

The Quarterly Census of Employment and Wages (QCEW) program produces a comprehensive tabulation of employment and wage information for workers covered by State unemployment insurance (UI) laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. The data are provided to the Department of City Planning (DCP) by the New York State Department of Labor (NYS DOL), and are geocoded and analyzed by DCP.

**S Sanborn Fire Insurance Maps**

These maps, produced by the Sanborn Map Company since 1867, include information about built structures such as building footprint, construction materials, and use of structures. The maps identify materials known to be fire accelerants, and show all pipelines, railroads, wells, dumps, and heavy machinery in an area.

**Shaded X Zone**

Areas of moderate coastal flood risk outside the regulatory 1% annual chance flood but within the limits of the 0.2% annual chance flood level.

**U United States Decennial Census**

The U.S. Census counts every resident in the United States, and takes place every 10 years. The data collected by the decennial census determine the number of seats each state has in the U.S. House of Representatives and is also used to distribute billions in federal funds to local communities.

**United States Toxic Release Inventory**

The US EPA also oversees the Toxic Release Inventory Program (TRI). TRI tracks the management of certain toxic chemicals that may pose a threat to human health. U.S. facilities in different industry sectors must report annually how much of each chemical is released to the environment and/or managed through recycling, energy recovery and treatment.

**Z Zone V / VE**

Zone V / VE An area of high flood risk subject to inundation by the 1% annual-chance flood event with additional hazards due to storm-induced velocity wave action (a 3-foot or higher breaking wave). Typically, this is the area where the computed wave heights for the base flood are 3 feet or more. V zones are subject to more stringent building requirements and different flood insurance rates than other zones shown on the FIRM because these areas are exposed to a higher level of risk than other coastal flooding areas.

## GLOSSARY OF ACRONYMS

<b>ACS</b>	American Community Survey
<b>BFE</b>	Base Flood Elevation
<b>BOA</b>	Brownfield Opportunity Area
<b>CBS</b>	Chemical Bulk Storage
<b>CEQR</b>	City Environmental Quality Review
<b>DTM</b>	Digital Tax Map
<b>FEMA</b>	Federal Emergency Management Agency
<b>FIRM</b>	Flood Insurance Rate Map
<b>IBZ</b>	Industrial Business Zone
<b>MOSF</b>	Major Oil Storage Facility
<b>MTA</b>	Metropolitan Transportation Authority
<b>NAVD</b>	North American Vertical Datum
<b>NFIP</b>	National Flood Insurance Program
<b>NPCC</b>	New York Panel on Climate Change
<b>NYC DCP</b>	New York City Department of City Planning
<b>NYC DEP</b>	New York City Department of Environmental Protection
<b>NYC DOB</b>	New York City Department of Buildings
<b>NYC DOT</b>	New York City Department of Transportation
<b>NYC EDC</b>	New York City Economic Development Corporation
<b>NYC OEM</b>	New York City Office of Emergency Management
<b>NYC OER</b>	New York City Office of Environmental Remediation
<b>NYS DEC</b>	New York State Department of Environmental Conservation
<b>NYS DOS</b>	New York State Department of State
<b>OIUS</b>	Open Industrial Uses Study
<b>PBS</b>	Petroleum Bulk Storage
<b>pFIRM</b>	Preliminary Flood Insurance Rate Map
<b>PLUTO</b>	Primary Land Use Tax Output
<b>PMAZ</b>	Priority Marine Activity Zone

<b>PWM</b>	Preliminary Work Map
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>SBIDC</b>	Southwest Brooklyn Industrial Development Corporation
<b>SFHA</b>	Special Flood Hazard Area
<b>SIRR</b>	Special Initiative for Rebuilding and Resiliency
<b>SMIA</b>	Significant Maritime and Industrial Area
<b>US EPA</b>	United States Environmental Protection Agency
<b>USFWS NWI</b>	United States Fish and Wildlife Service National Wildlife Inventory
<b>VFP</b>	Vacant Fill Property
<b>WRP</b>	Waterfront Revitalization Plan

# FIELD SURVEY Sample Survey Sheet

APPENDIX

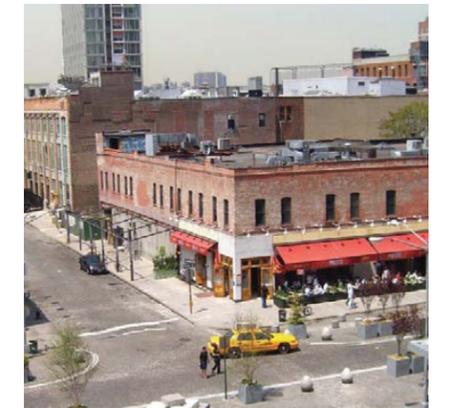
RED HOOK BUA FIELD SURV  
Dept. of City Planning - June, 2013

Section	Block	Lot	Building Type (R,C,I,W,G,MIX,P,O)	Occupancy (o,v,x)	Sale or Lease Signage? (y,n)	Open or closed industrial uses? (o,c,p,x)	Observable Basement? (y/n)	Estimated elevation of lowest window or door above ground? (to nearest foot)	Notes
Section 1									
1	583	36							
1	583	30							
1	583	28							
1	583	23							
1	583	1							
1	572	1							
1	562	49							
1	562	47							
1	562	46							
1	562	37							
1	562	33							
1	562	32							
1	562	29							
1	562	28							
1	562	27							
1	562	26							
1	562	25							

# CEQR

## City Environmental Quality Review Technical Manual

### CEQR TECHNICAL MANUAL Hazardous Materials Appendix



**NYC** Mayor's Office of  
Environmental Coordination

JANUARY 2012 EDITION (REV. 6/5/13)

WARNING: These printed materials may be out of date.  
Please ensure you have the current version that can be found on [www.nyc.gov/oec](http://www.nyc.gov/oec).

## LIST OF FACILITIES, ACTIVITIES, OR CONDITIONS REQUIRING ASSESSMENT

1. A facility, on or adjacent to a tax lot, which generates (including small quantity generators), stores, treats, or disposes of hazardous waste, as defined by RCRA and regulated by EPA and/or DEC.
2. A facility, on or adjacent to a tax lot, which manufactures, produces, prepares, compounds, processes uses, repackages or disposes of hazardous chemicals, as defined under New York City's Community Right-to-Know Law, N.Y.C. Admin. Code tit. 24, Ch. 7 (1992).
3. A facility, on or adjacent to a tax lot, which is included on the following list:
  - Adhesives and sealants manufacture
  - Advertising displays manufacture
  - Agricultural machinery manufacture (including repairs)
  - Aluminum manufacture or aluminum products manufacture
  - Aircraft manufacture (including parts)
  - Airports Appliance (electrical) manufacture
  - Art goods manufacturer
  - Asphalt or asphalt products manufacture
  - Athletic equipment manufacture
  - Automobile and other laundries
  - Automobile manufacture
  - Automobile rental establishments
  - Automobile wrecking establishments
  - Automobile service stations
  - Battery manufacture
  - Bicycle manufacture
  - Blacksmith shops
  - Boat repair
  - Boat fuel sales
  - Boat storage
  - Business machine manufacture
  - Camera manufacture
  - Canvas or canvas products manufacture
  - Carpet cleaning establishments
  - Carpet manufacture
  - Cement manufacture
  - Ceramic products manufacture
  - Charcoal manufacture
  - Chemical compounding or packaging
  - Chemical manufacture
  - Cleaning or cleaning and dyeing establishments
  - Clock manufacture
  - Clothing manufacture
  - Coal products manufacture
  - Coal sales or storage
  - Coke products manufacture
  - Coil coating
  - College, university, trade school laboratories
  - Construction machinery manufacture
  - Copper forming or copper products manufacture
  - Cosmetics or toiletries manufacture
  - Dental instruments manufacture
  - Dental laboratories
  - Disinfectant manufacture
  - Drafting instruments manufacture
  - Dry cleaning establishments
  - Dumps
  - Electric power or steam generating plants
  - Electric power substations
  - Electric and electronic components manufacture
  - Electric appliance manufacture

WARNING: These printed materials may be out of date.  
Please ensure you have the current version that can be found on [www.nyc.gov/oec](http://www.nyc.gov/oec).

## HAZARDOUS MATERIALS APPENDIX

- Electric supplies manufacture
- Electroplating or stereotyping
- Engraving or photo-engraving
- Exterminators
- Explosives manufacture
- Felt products manufacture
- Felt products bulk processing, washing or curing
- Fertilizer manufacture
- Filling stations
- Film manufacture
- Fire stations
- Foundries ferrous or non-ferrous
- Fuel sales
- Fungicides manufacture
- Fur tanning, curing, finishing or dyeing
- Furniture manufacture
- Garbage incineration, storage or reduction
- Gas manufacture, storage
- Gasoline service stations
- Generating plants, electric or steam
- Glass manufacture
- Glue manufacture
- Golf courses
- Graphite or graphite products manufacture
- Gum and wood chemicals manufacture or processing
- Hair products manufacture
- Hardware manufacture
- Heliports
- Incineration or garbage reduction
- Ink or ink ribbon manufacture
- Insecticides manufacture
- Inorganic chemicals manufacture
- Iron and steel manufacture
- Jewelry manufacture
- Junk yards
- Laboratories, medical, dental, research, experimental
- Leather tanning, curing, finishing or dyeing
- Linoleum manufacture
- Luggage manufacture
- Lumber processing
- Machine shops including tool, die, or pattern making
- Machine tools manufacture
- Machinery manufacture or repair
- Mechanical products manufacture
- Medical appliance manufacture
- Medical instruments manufacture
- Medical laboratories
- Metals manufacture including alloys or foil
- Metal casting or foundry products
- Metal finishing, plating, grinding, polishing, cleaning, rust-proofing, heat treatment
- Metal ores reduction or refining
- Metal product treatment or processing
- Metal reduction, refining, smelting or alloying
- Metal treatment or processing
- Mining machinery manufacture
- Mirror silvering shops
- Motorcycle manufacturer
- Motor freight stations musical instruments manufacture
- Newspaper publishing
- Non-ferrous metals manufacture
- Office equipment or machinery repair shops
- Oil, public utility stations for metering or regulating oil sales
- Oil storage
- Optical equipment manufacture
- Organic chemicals manufacture
- Orthopedic appliance manufacture

WARNING: These printed materials may be out of date.  
Please ensure you have the current version that can be found on [www.nyc.gov/doh](http://www.nyc.gov/doh).

## HAZARDOUS MATERIALS APPENDIX

- Ore mining
- Paint and ink manufacture
- Paper and pulp mills
- Paper products manufacture
- Pesticides manufacture
- Petroleum or petroleum products refining
- Petroleum or petroleum products storage and handling
- Pharmaceutical products manufacture or preparation
- Photographic equipment and supplies manufacture
- Plastics and synthetic products manufacture and processing
- Plastics raw manufacture
- Plumbing equipment manufacture
- Porcelain enameling
- Precision instruments manufacture
- Printing and publishing
- Pumping stations, sewage
- Radioactive waste disposal services
- Railroad equipment manufacture
- Railroad rights-of-ways, substations
- Railroad freight terminals, yards or appurtenances
- Refrigerating plants
- Rubber processing of manufacture
- Rubber products manufacture
- Sewage disposal plants, pumping stations
- Ship or boat building repair yards
- Shipping waterfront
- Shoes manufacture
- Sign painting shops
- Silver-plating shops
- Silverware manufacture, plate or sterling
- Slag piles
- Soap and detergent manufacture
- Soldering shops
- Solvent extraction
- Steam electric power plants
- Steel products manufacture
- Tar products manufacture
- Textiles bleaching, products manufacture or dyeing
- Textile mills
- Thermometer manufacture or assembly
- Tile manufacture
- Timber products manufacture
- Tool or hardware manufacture
- Toys manufacture
- Trailer manufacture
- Transit substations
- Truck manufacture
- Trucking terminal or motor freight stations
- Turpentine manufacture
- Varnish manufacture
- Vehicles manufacture
- Venetian blind manufacture
- Welding shops
- Wood distillation