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# WEST 45<sup>th</sup> STREET GAS WORKS SITE HISTORY REPORT

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*Prepared By:*

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**JUNE 2002**

*Report For:*

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SITE HISTORY REPORT**

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**JUNE 2002**

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## EXECUTIVE SUMMARY

Consolidated Edison Company of New York (Con Edison) contracted Parsons to conduct historical research of former manufactured gas plants (MGPs) and associated facilities that were used either by Con Edison or predecessor companies of Con Edison. Parsons was assigned a group of sites located in the Borough of Manhattan. This report presents the results of the historical research conducted for the West 45<sup>th</sup> Street Gas Works site. The objective of the MGP research is to obtain information necessary to rank and prioritize the sites for future investigation or other management actions under the pending Voluntary Cleanup Agreement (VAC) between Con Edison and the New York State Department of Environmental Conservation (NYSDEC). In order to meet this objective, data were compiled to provide information on site setting, current and past site ownership and use, MGP development and operations, site physiography and hydrogeology, potential on-site and off-site historic waste materials, and potential public and environmental receptors.

The West 45<sup>th</sup> Street Gas Works formerly existed on portions of two city blocks (Blocks 1092 and 1093) and the adjacent waterfront in the Borough of Manhattan, New York City and New York County, New York. The West 45<sup>th</sup> Street Gas Works operated from 1887 to 1913. The western fourth of Block 1092 and 1093 were taken by the City of New York in 1913 for the reconfiguration of roadways in association with inland pier extensions. The Gas Works stopped operation in 1913 and most of the buildings were razed. A large gas holder continued to be used until 1965. The remaining property on Block 1092 is presently used for warehouses and a parking lot, and the remaining property on Block 1093 is used for a parking lot and a natural gas refueling station. The rest of the former Gas Works is under 12th Avenue and the West Side Highway/Joe DiMaggio Highway. The extreme eastern ends of Piers 84 and 86 (currently numbered City Piers 21 and 30) were part of the site, but likely were only used for unloading coal from docked barges along the waterfront. No structures were built on the piers during occupancy by the MGP.

Construction of multiple-story warehouse buildings with basements on Block 1092 in 1923 likely removed all traces of the Gas Works in that location. The parking lot in the center of the block (Tax Lot 16) may retain remnants of the former Gas Works. The portion of the block now under 12th Avenue and the West Side Highway may also retain parts of the MGP, if they have not been destroyed by road work.

The historical research and site reconnaissance identified the following key items for consideration in the prioritization of the former gas works sites:

- The West 45<sup>th</sup> Street MPG operated from 1878 through 1913 and the large gas holder on Block 1093 operated until 1965.
- Con Edison no longer owns any of the approximately 5.4 acre site.
- Portions of the former site are presently used for parking lots. These open areas would have the potential for redevelopment.



- The site reconnaissance did not identify any former gas works structures, except for the retaining walls for the former gas holder pads. The potential for direct contact exposure to former Gas Works remnants is low because most of the former site is pavement or has buildings on it. Potentials direct contact exposure is limited to workers conducting excavation work.
- The waterfront west of Blocks 1092 and 1093, labeled Block 1107, should not contain any significant resources associated with the MGP. Soils from this area were removed during the inland expansion of the piers.
- The site reconnaissance conducted April 10, 2002 did not identify any visual evidence of impacts or Gas Works residuals (staining, seeps, tar boils, or odors). However, access to the former gas works site was limited to the sidewalk and public areas. Staining was previously identified in a 1998 Phase I report for the Tax Lot 9 on Block 1093 prepared by Foster Wheeler.
- Previous sampling conducted by Con Edison in 1997 and Allee, King, Rosen, & Fleming, Inc. in 1998, for a potential property transfer, found the presence of BTEX, SVOCs, TPH and lead in soils and BTEX, SVOCs, metals and TPH in groundwater at Block 1093 Lot 9 during sampling for a potential property transfer. The results indicate remnants of past operations may be present below the ground surface at portions of the former Gas Works.
- The EDR report indicates the potential exists for spills and leaks from other sources within the area.
- The site is located in an area of mixed commercial, industrial, tourist, and residential uses. If Gas Works residuals are present at the site, potential receptors would include site workers, nearby residents, and tourists visiting the USS Intrepid Sea, Land, and Space Museum. Workers conducting excavation activities could encounter residues from past operations.
- The nearest public school is the PS 51 Elias Howe School located less than 0.25 miles east of the site.
- Residences, a park, and a playground are also present within 0.25 miles of the site.
- The Hudson River is within 200 feet of the former Gas Works and could be impacted if Gas Works residuals were migrating from the site or if past disposal practices lead to the disposal of Gas Works-related materials in or near the Hudson River. The Hudson River had slight sheens and wind-blown trash near the site comparable with normal conditions found in the Manhattan waterfront. Evidence of MGP impacts was not observed.
- Two onsite warehouse buildings and neighboring buildings have basements. The potential for seepage or volatilization into basement areas exists if Gas Works residuals are present in subsurface soils.

# SECTION 1

## OBJECTIVE

### 1.1 PROJECT BACKGROUND

Con Edison contracted Parsons to conduct historical research of former MGPs and associated facilities that were either owned by Con Edison or predecessor companies of Con Edison. Parsons was assigned a group of sites located in the Borough of Manhattan. This report presents results of the historical research conducted for the West 45<sup>th</sup> Street Gas Works site located in the Hell's Kitchen section of Manhattan.

### 1.2 PURPOSE

This report documents results of the historical research completed on the West 45<sup>th</sup> Street Former Gas Works site located between West 44<sup>th</sup> Street and West 46<sup>th</sup> Street and 11<sup>th</sup> Avenue and 12<sup>th</sup> Avenue in western Manhattan, New York (Figure 1). All report figures are located between Section 11 and Appendix A. The purpose of the historical research was to:

- Determine the physical limits of the former gas works operations.
- Develop an understanding of past operations at the former gas works.
- Identify products, byproducts, waste handling procedures, waste streams and potential hazardous substances and usage of the site to assess of potential impacts if any, to adjacent properties and current site occupants.
- Develop historical and current site data that will support prioritization of the 47 former MGP sites based on potential, actual, and perceived human health exposure risks, environmental impacts, sensitive receptors, current site usage, the surrounding community, potential for development, site control and ownership, and size of the former MGP operation.

### 1.3 INVESTIGATION METHODOLOGY

Investigations for this report consisted of historical research to summarize site ownership, occupancy, use, and operations over time (including pre-gas works use, use during gas works operation, and post-gas works use), a site reconnaissance to determine current conditions and neighboring property use, and review of federal, state, and local databases to assess other sites in the vicinity that may be impacting the former gas works site and the neighboring properties.

Research undertaken as part of this report included review of in-house documents and photographs provided by Con Edison, as well as materials gathered at the Municipal Archives of the City of New York, the Municipal Reference and Research Center of the City of New York, the New York City Recorder of Deeds office, the New York City Department of Buildings, the New York Public Library, the Library of Congress, the NYSDEC, the Environmental Protection Agency, and various web sites that post historical maps and journal articles. EDR compiled the radius search data for the site.

The following is a summary of the resources reviewed during the research and preparation of this report; a detailed list of references is provided in Section 11:

- Consolidated Edison internal records and files (including remediation files and reports, real estate records, in-plant property records, and historical photographs)
- Consolidated Edison personnel interviews
- Historical maps, including Sanborn Fire Insurance Maps, Dripps Maps, Perris and Browne Insurance Maps, Bromley Atlases, and Taylor City Map,
- Deeds and site surveys for the properties
- Nineteenth century tax assessment records
- New York City Department of Buildings records
- Books and articles detailing manufactured gas company histories and operating procedures
- Manufactured gas industry publications (including the *American Gas Light Journal*, in later years called the *American Gas Journal*)
- Brown's Directory of American Gas Companies
- Public Service Commission (PSC) reports
- Nineteenth and twentieth century newspaper and journal articles (such as the *New York Times*)
- Environmental studies undertaken within and adjacent to the properties
- EDR radius search information.

Ms. Susan Shelton and Ms. Julie Abell Horn of Parsons conducted the site reconnaissance on April 10, 2002. Tasks included a windshield and pedestrian survey (where possible) of the property, photographing buildings, structures, and roadways on and adjacent to the former MGP site, documenting current conditions and possible receptors, and creating an overall site map.

## SECTION 2

### PROPERTY DESCRIPTION

#### 2.1 PROPERTY DESCRIPTION

The former West 45<sup>th</sup> Street Gas Works site is located in the Borough of Manhattan, New York City and New York County, New York (Figure 1). The former West 45<sup>th</sup> Street Gas Works site consists of five current Tax Lots straddling two city blocks, and includes a portion of waterfront property west of the former gas works site (Figure 2). The former site occupied an area of approximately 5.4 acres and includes portions of Block 1092 (all of Tax Lots 7, 16, and 49), Block 1093 (all of Tax Lot 9 and part of Tax Lot 21), and Block 1107 (the waterfront property west of Blocks 1092 and 1093). Blocks 1092 and 1093 are bounded by West 44<sup>th</sup> Street on the south, West 46<sup>th</sup> Street on the north, 11<sup>th</sup> Avenue on the east, and 12<sup>th</sup> Avenue on the west. Block 1107 and the western ends of Blocks 1092 and 1093 were truncated for the inland extension of the Hudson River piers (City 21 and City 30) and the reconfiguration of 12<sup>th</sup> Avenue and Marginal Street in the early twentieth century, and the later construction of the West Side Highway (Route 9A) during the 1920s and 1930s. It should be noted that the existing five Tax Lots are an amalgam of smaller real estate lots, which were historically sold to the Municipal Gas Light Company (Con Edison's predecessor company) by individual owners. Section 5 of this report provides a detail of the histories of the Tax Lots. Parts of the former gas works site footprint extend into the present streets. Figure 3 shows the current street configuration with an overlay of the former gas works structures.

## SECTION 3

### CURRENT USAGE

#### 3.1 GENERAL

The current usage of the former gas works property was determined from a site reconnaissance conducted on April 10, 2002. The site reconnaissance was supplemented with title search information, tax map information, and aerial photographs. The site is located in a mixed usage area with the Hudson River, waterfront piers, and the Intrepid Sea, Land and Space Museum located to the west, and commercial properties including warehousing, ground shipping, auto repair shops, restaurants, parking lots, light manufacturing, and residential areas to the north, east, and south. The residences are multifamily apartments approximately four to five stories to the east and high-rise apartments to the south. Details of current land use on each block are described in the following paragraphs. Photographs of the site are provided in the photolog in Appendix A. Tables 3.1 and 3.2 present a summary of the current ownership and usage.

#### 3.2 BLOCK 1092 LAND USE

Current land use on Block 1092 consists of commercial operations including storage facilities, a pub, and an open parking lot utilized by United Parcel Service (UPS). The western portion of Block 1092 (frontage on 12<sup>th</sup> Avenue/West Side Highway) is bisected by two multi-story commercial storage businesses that occupy Lots 7 and 49. Time Moving Storage is located on Lot 49 on the corner of West 45<sup>th</sup> Street and West Side Highway (photograph 1). Manhattan Mini-Storage is located on Tax Lot 7 on the corner of West 44<sup>th</sup> Street and 12<sup>th</sup> Avenue (photograph 2). An asphalt driveway/alleyway separates Lots 7 and 49 from Lot 16 located adjacent and east of the two aforementioned lots. Tax Lot 16 is currently used as a parking lot by UPS. Access to the parking lot may be obtained from either West 44<sup>th</sup> Street or West 45<sup>th</sup> Street. During the site inspection performed on April 10, 2002, two concrete fueling islands were observed near the entrance to the parking lot. There were two fuel pumps on each island. The entire parking lot is covered by asphalt and no areas of cracked and/or degraded asphalt were observed during the site visit. However, observations were made from the areas accessible to the general public. The parking lot is built on a raised area surrounded by a stone and mortar wall which is approximately six to seven feet above the surrounding concrete sidewalk (photograph 3). This area was the former location of five gas holders dating back to 1880. The eastern portion of the Block 1092 Tax Lots 29, 30, and 36, having frontage on 11<sup>th</sup> Avenue, contains commercial structures including a pub (Tax Lot 29) and two multi-story buildings (Tax Lots 30 and 36). These 3 Tax Lots were not part of the former gas works site.

**Table 3.1 – Former Gas Works Lots In Block 1092**

Lot Number	Current Owner	Current Usage
Lot 7	Edison West 44 <sup>th</sup> Street Company, LLC	Manhattan Mini-Storage
Lot 16	North Quarter Corporation	United Parcel Service Parking Lot
Lot 49	John Kevin Gilgan and Joseph P. Candella	Warehousing (previous business name Time Moving and Storage, Inc. still on building).

M2 – Medium Manufacturing

The only former gas works remnant observed on this block was the raised and walled area currently occupied by the UPS parking lot. Due to limited site access, the status and condition of the UPS underground storage tanks (USTs) could not be verified. Hazardous waste and petroleum usage and, storage, or disposal was not observed at the other commercial structures on Block 1092 during the site visit. Municipal solid waste containers were observed adjacent to Manhattan Mini-Storage, McQuaid’s Pub and the multi-story building located adjacent and north of McQuaid’s Pub. With the exception of the diminimus blown refuse and general litter, the area appeared well maintained.

### **3.3 BLOCK 1093 LAND USE**

Commercial structures on Block 1093 include surface parking lots, a lumber business, an auto body collision repair shop, a natural gas fueling station. The western portion of Block 1093 (Tax Lot 9) with frontage on 12<sup>th</sup> Avenue/West Side Highway is a parking lot. The parking lot is bisected with Con Edison occupying the northern half at the intersection of West 46<sup>th</sup> Street and 12<sup>th</sup> Avenue (photograph 4) and NYSDOT occupying the southern half at the intersection of West 45<sup>th</sup> Street and 12<sup>th</sup> Avenue. Tax Lot 9 is owned by the State of New York and will eventually be vacated by Con Edison. The parking lot is built on a raised area surrounded by a stone and mortar wall approximately six to seven feet above the surrounding concrete sidewalk. This wall is similar in height and construction to the structure located on Block 1092 and described in the previous section. A former gas holder was located in this area prior to 1965. It appears that the raised area may be a remnant of the former gas works. Access to the parking area was restricted during the site reconnaissance therefore the condition of the parking surface could not be verified. Access to the parking area is from West 45<sup>th</sup> Street. During the site reconnaissance, construction equipment and Con Edison utility vehicles were parked in the lot (photograph 5). An active Con Edison Natural Gas Vehicle Refueling Station is located on the eastern end of Tax Lot 9. Access to the Refueling Station is gained via West 45<sup>th</sup> Street and is monitored by a guard. The fueling station area is covered by asphalt that appeared to be in good repair. The former gas holder also occupied a large portion of the adjacent parking area to the south currently owned by the State of New York (NYSDOT parking). The portion of Tax Lot 9 occupied by the NYSDOT is currently undergoing construction and excavation activities. During the site reconnaissance on April 10, 2002, a pre-cast concrete structure was observed

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along the western property boundary (photographs 6 and 7) and evidence of excavation activities were observed. There were no odors or stained soils observed from the available vantage points during the site reconnaissance.

A commercial parking lot occupies the center of Block 1093 in Tax Lot 21. Access to the parking lot is from either West 45<sup>th</sup> Street or West 46<sup>th</sup> Street (photographs 8 and 9). The parking lot appeared to be covered entirely by asphalt. The asphalt appeared to be in good condition at the time of the site reconnaissance. The eastern portion of the Block 1093 with frontage on 11<sup>th</sup> Avenue consists of Lots 28, 31, 33, and 36 with commercial business including a lumber business and an automotive repair shop (photograph 10). Construction on a multi-story parking garage is currently taking place at the north corner of West 45<sup>th</sup> Street and 11<sup>th</sup> Avenue on Lot 29 (photograph 11). There were no odors or stained soils observed from the available vantage points during the site reconnaissance.

**Table 3.2 – Former Gas Works Lots In Block 1093**

Lot Number	Current Owner	Current Usage
Lot 9	People of the State of New York	Con Edison natural gas refueling station and parking and NYSDOT parking. Planned for bus parking and pedestrian bridge to Intrepid Sea, Air, and Space Museum.
Lot 21	NA	Parking

M2 – Medium Manufacturing

M3 – Heavy Manufacturing

The only remnant of the former gas works was the raised and walled area currently occupied by the Con Edison parking lot and the NYSDOT construction site. The condition of tanks at the Con Edison Natural Gas Refueling Station could not be evaluated due to limited site access. The other commercial structures on Block 1093 did not provide evidence of storage of hazardous waste materials. Municipal solid waste containers were observed adjacent to the commercial parking lot and Metropolitan Lumber. The contents of the automotive repair shop (i.e., tanks, drums, storage containers, and materials usage) and their disposal practices could not be determined during the site reconnaissance. The automotive repair shop is surrounded by other buildings on three sides. A roll-off container, used to collect construction and demolition debris, was observed adjacent to the construction activity located at the north corner of West 45<sup>th</sup> Street and 11<sup>th</sup> Avenue. With the exception of wind-blown refuse and general litter, the area appeared well maintained.

### 3.4 BLOCK 1107 LAND USE

Block 1107 is a portion of the existing waterfront located west of Blocks 1092 and 1093. This area was historically part of MGP operations at the West 45<sup>th</sup> Street Gas Works. The area is currently occupied by the West Side Highway and piers along the Hudson River. The Intrepid Sea, Air, and Space Museum visitors' center is located in this area (photograph 12).

## SECTION 4

### SITE SETTING

#### 4.1 INTRODUCTION

This section describes the current zoning, characteristics of the neighboring properties, topography, demography, geology and hydrogeology. Information in this section was developed during the site reconnaissance visit conducted on April 10, 2002 and through the collection and review of New York City tax and zoning files, historical reports, and the radius search report.

#### 4.2 DEMOGRAPHY

The population of Manhattan Borough is 1,537,195 people. Census Tract 129 encompasses Blocks 1092 and 1093 and blocks north, south, and east. The population in Census Tract 129 is 4,457 people. The population is approximately 63 percent white with the rest of the population being ethnically diverse. The median age is 33.4 years. There are more male residents than female. There are 2,327 households in Tract 129. Approximately 85.5 percent of housing (1990 units) is renter occupied housing and 14.5 percent (337 units) is owner occupied. The average household size is 1.60 people (owner occupied) and 1.83 people (renter occupied).

#### 4.3 ZONING

Within the general geographic area of the site, property usage is residential, light commercial, light industrial, medium and heavy manufacturing. Tables 4.1 and 4.2 list the zoning for the Tax lot numbers for Block 1092 and 1093 that comprise the former gas works site. The site is bordered to the west by Route 9A - West Side Highway/Joe DiMaggio Highway and to the east by 11<sup>th</sup> Avenue.

**Table 4.1 – Former Gas Works Lots In Block 1092**

Lot Number	Current Zoning	Current Usage
Lot 7	M2	Manhattan Mini-Storage
Lot 16	M2	United Parcel Service Parking Lot
Lot 49	M2	Warehousing (previous business name Time Moving and Storage, Inc. still on building).

M2 – Medium Manufacturing



**Table 4.2 – Former Gas Works Lots In Block 1093**

Lot Number	Current Zoning	Current Usage
Lot 9	M3	Con Edison natural gas refueling station and parking and NYSDOT parking. Planned for bus parking and pedestrian bridge to Intrepid Sea, Air, and Space Museum.
Lot 21	M2	Parking

M2 – Medium Manufacturing

M3 – Heavy Manufacturing

#### **4.4 CHARACTERISTICS OF NEIGHBORING PROPERTIES**

Within a one-quarter mile radius of the West 45<sup>th</sup> Street site the neighboring properties consist of residential town homes and apartment buildings, restaurants, commercial storage facilities, commercial and private parking lots, retail stores, tourist attractions, and automotive repair and dry-cleaning facilities. Route 9-A and the Hudson River are located directly west of the site. Commercial structures including storage and moving facilities, automotive repair and cleaning companies are present to the northwest and southwest of the site along Route 9-A. Tourist attractions including the Intrepid Sea, Air, and Space Museum are located directly west of the site along the Hudson River. Other attractions such as restaurants and recreational activity centers are also located along the piers within the general vicinity of the site. Residential properties including multi-story apartment buildings, commercial retail facilities as well as public parking lots are present east of the site. The areas to the north and south of the site mainly consist of light industrial and commercial facilities. The area buildings are generally well maintained and the roads are in good condition. The roads receive a heavy volume of traffic. The area has a high density of people working in the businesses and who live in the multifamily and high-rise housing.

#### **4.5 TOPOGRAPHY AND SURFACE WATER DRAINAGE**

The general site topography is gently sloping to the west/southwest toward the West Side Highway and subsequently to the Hudson River. The elevation near the intersection of West 45<sup>th</sup> Street and 12<sup>th</sup> Avenue is 14 feet above mean sea level (amsl) and the elevation near the intersection of West 45<sup>th</sup> Street and 12<sup>th</sup> Avenue is approximately 17 feet amsl. The parking lot currently utilized by UPS, located on Block 1092 Lot 16, and the parking lots used by Con Edison and NYSDOT on Block 1093 Lot 9 are elevated approximately six to seven feet above the sidewalk elevation. In the remaining areas where the surfaces are covered with asphalt, the topography is generally gently sloping toward the adjacent side streets.

Based upon observations made during the site reconnaissance visit, the apparent surface water drainage is in a radial pattern toward the nearest street. Surface water drainage would then likely flow along West 44<sup>th</sup>, West 45<sup>th</sup>, and West 46<sup>th</sup> Streets in the general direction running from 11<sup>th</sup> Avenue, westward toward the West Side Highway and subsequently to the Hudson River. Storm sewers are present along West Side Highway to collect surface water runoff from the adjacent side streets. Blocks 1092 and 1093 fall within the 500 year flood plane and the area west of 12<sup>th</sup> Avenue (Block 1107) falls within the 100 year flood plane.

## **4.6 REGIONAL GEOLOGY**

The bedrock underlying the project site is the Manhattan Formation, composed of gray to black mica schist that has been intensely folded and deformed by the two major episodes of mountain building during the Paleozoic Era, more than 200 million years ago. The depth of the bedrock surface in the project area varies from more than 150 feet below ground surface (bgs) in the Chelsea section approximately 2.2 miles to the southwest to near the surface in the Clinton area of Manhattan approximately 1 mile to the north (Allee King Rosen & Fleming, 1994). Depths to bedrock in the site vicinity have been reported from five to 30 feet.

Bedrock is generally overlain by Pleistocene glacial deposits. During the past 35,000 years of the Pleistocene Epoch (the Ice Age), bedrock has been abraded and eroded by four episodes of glaciation. During the Wisconsinian Stage (the last of the four stages), large volumes of sand, gravel, and rock were deposited along the margins of the Hudson River Valley (Allee King Rosen & Fleming, 1994).

## **4.7 SITE GEOLOGY**

Boring logs from the Route 9a Reconstruction Project (Allee, King, Rosen & Fleming, 1998) and the Phase I Environmental Site Assessment for the West 45<sup>th</sup> Street Operations Center (Foster Wheeler, 1998) indicate the site and surrounding properties are constructed on fill material, overlying unconsolidated materials. Saturated soils were encountered at depths ranging from 5.5 to 8 feet bgs. Reported depths to bedrock in the vicinity of former West 45<sup>th</sup> Street Gas Works range from 5-30 feet bgs. According to the boring logs for the West 45<sup>th</sup> Street property, the fill material beneath the site consists of gravel, brick, slag, concrete, and coal ash and extends to a depth of approximately 5-10 feet bgs. Sand, silt, and schist were noted below the fill in several of the boreholes. One borehole also indicated the presence of limestone at 10 feet bgs (Foster-Wheeler, 1998). Plans for the Greyhound bus facility constructed on Block 1092 Lot 16 in the early 1940s indicated footings for the new building were dug to depths of 15 to 30 feet to reach "solid ground".

## **4.8 HYDROLOGY/HYDROGEOLOGY**

Manhattan is an island of approximately 22 square miles and is surrounded by brackish or salty tidal water. The Hudson River is located less than 0.25 miles west of the site, and the East River is located less than two miles east of the site. The Hudson River is classified as an "I" surface water body adjacent to the West 45<sup>th</sup> Street site (NYSDEC, 2001). Class I waters fall within the Interstate Sanitation District. Class I waters are suitable for secondary contact recreation and any other use except primary contact recreation and shellfishing for market purposes.

The area is characterized by a relatively mild climate with an average precipitation of approximately 45 inches per year. The primary source of groundwater is precipitation; however, recharge precipitation in Manhattan is probably much less than 50 percent of total recharge because the majority of surface area is paved. Secondary sources of groundwater recharge are leakage from sewer and water lines, and infiltration of surface water. Manhattan's drinking water is obtained from reservoirs located greater than 25 miles north of the city. No drinking water supply wells were identified in the vicinity of the site (EDR, 2002 and NYSDOH, 1982). The EDR report did identify a public water system location within 0.25 miles. However, this

supply is actually located upstate in Liberty, New York. The supply owner apparently resides in the vicinity of the site. The usage of local groundwater is not likely since the public water supply is readily available. However, the fresh groundwater would be compared to Class GA groundwater standards.

Prior to significant construction and development, Manhattan was drained by approximately 12 shallow creeks, which emptied into the Hudson, Harlem, and East Rivers. Most of these creeks are now filled in and covered by buildings and streets, but the location of the old channels may have some influence on the occurrence and movement of shallow groundwater in the region. Depths to groundwater at the former Gas Works were reported from 5.5 to 8 feet bgs based on boring log information (Allee, King, Rosen & Fleming, 1998). Groundwater is expected to flow in a westerly direction toward the Hudson River. Groundwater elevation contour maps were not available for the site.

## SECTION 5

### PAST OWNERSHIP

#### 5.1 INTRODUCTION

This section describes the past ownership of the site. Ownership history is divided into three parts; pre-gas works, the gas-works period, and post-gas works. In addition to the title search results that are presented in Appendix D, Sanborn Insurance Maps from 1890 to 1996 and other historical maps and atlases were used to develop the chain of ownership and evolution of site operations.

The former Gas Works site occupied five modern Tax Lots spanning two city blocks (Block 1092 and 1093), and the waterfront property (Block 1107) west of these two blocks (see Section 2.1). The large Tax Lots originally included a number of smaller real estate lots (referred to throughout this report simply as Lots), which were sold to the Municipal Gas Light Company (Con Edison's predecessor company) by individual owners. Over time, these smaller lots were merged into the larger Tax Lots and renumbered.

#### 5.2 PRE-MGP OWNERSHIP AND USE

The West 45<sup>th</sup> Street Gas Works supported various structures during the 1830s-1870s, prior to its use as a MGP. The following text summarizes use on the properties on a block-by-block basis during these years.

##### Block 1092 (bounded by West 44<sup>th</sup> and West 45<sup>th</sup> Streets, 11<sup>th</sup> and 12<sup>th</sup> Avenues)

Historic maps indicate that Block 1092 was undeveloped, with its western end under water, through the 1830s and 1840s. The 1836 Colton map (Figure 4) does not illustrate any structures on the block, and shows that its western end had not yet been reclaimed from the Hudson River and was still under water. The map depicts an unnamed drainage traversing the eastern end of the block in a roughly north-south direction, emptying into a small cove south of 42<sup>nd</sup> Street. The eastern end of the block appears to be higher in elevation than the surrounding area. The 1865 Viele map (Figure 5), which shows the original topography and hydrology of Manhattan Island, confirms that the block was partially under water.

By the 1850s, Block 1092 had begun to support various structures. The 1852 Dripps map (Figure 6) shows eight unidentified structures along 11<sup>th</sup> Avenue, outside the area that would become the MGP. The rest of the block, where the MGP later would be constructed, is depicted as undeveloped. Tax assessment rolls for the block indicate that by 1855, there were 26 houses on the block, the majority owned by William Menzies (Assessed Valuation of Real Estate 1855).

In 1867, an updated Dripps map (Figure 7) shows that development had grown to include structures along West 44<sup>th</sup> and West 45<sup>th</sup> Streets, near their intersection with 11<sup>th</sup> Avenue, in areas later occupied by the MGP. Separated from these structures, a building identified as "Menzies Saw Mill" is shown at the western end of the block, overlapping the former shoreline

and within the future MGP boundaries. The 1871 Perris and Browne insurance map (Figure 8) renders these structures in more detail, and illustrates the westward progress of landfilling operations along the shoreline.

#### Block 1093 (bounded by West 45<sup>th</sup> and West 46<sup>th</sup> Streets, 11<sup>th</sup> and 12<sup>th</sup> Avenues)

Like the block to the south, most of Block 1093 was undeveloped through the 1830s, with its western end under the Hudson River. The 1836 Colton map (Figure 4) illustrates a cluster of four structures where West 46<sup>th</sup> Street intersected 11<sup>th</sup> Avenue. Two of these structures appear to overlap Block 1093, although in an area that is not part of the former gas works site footprint. The drainage shown in Block 1092 crosses the southeast corner of Block 1093 as well. The 1865 Viele map (Figure 5) illustrates the original shoreline at the western end of the block.

By the 1850s, Block 1093 supported a number of structures, as shown on the 1852 Dripps map (Figure 6). Included is a large building along the south side of West 46<sup>th</sup> Street labeled “Cow Hide Whip and Sand Paper Factory,” which falls within the future footprint of the MGP site. Tax assessment rolls reveal 21 houses on the block in 1855, belonging to various owners and occupants (Assessed Valuation of Real Estate 1855).

The 1867 Dripps map (Figure 7) shows further development on Block 1093, and indicates the factory building along 46<sup>th</sup> Street may have been replaced by a larger structure, or perhaps reconfigured and enlarged. In 1871, the Perris and Browne map (Figure 8) indicates this structure (or replacement structure) was now an iron foundry. The area west of the foundry is labeled a timber yard. Other areas of the block, outside the future MGP site area, are shown to include a stone yard and a kindling wood yard.

#### Block 1107 (waterfront west of Blocks 1092 and 1093)

Historic maps from the 1830s to early 1870s (Figures 4 through 8) illustrate that Block 1107 was completely under water through at least 1871.

### **5.3 MGP HISTORY**

The Municipal Gas Light Company, which purchased the property that would become the West 45th Street Gas Works, originally was organized as the New York Oxygen Gas Company. Its goal was to generate oxygen and hydrogen gases using two 1867 U.S. patents issued to Cyprien Marie Tessie du Motay and Charles Raphael Marechal. The company’s main thrust was to implement the oxygen gas process, but this proved financially untenable, and as a result the founders had to sell their assets and patent rights at a sheriff’s sale in 1873. The buyer was Robert McCrosky Graham of Astoria, president of the Metropolitan Insurance Company, who, with a group of other businessmen, founded the Municipal Oxygen Gas Company in May 1874. The company acquired not only the two 1867 patents, but a second Tessie du Motay patent from 1869. In the winter of 1875-76, Graham sold a controlling interest of the company to financier Charles Francklyn, whose first order of business was to change the name of the organization to simply the Municipal Gas Light Company. The oxygen gas process, from which the earlier company had taken its name, had proven impractical to implement on a large scale, but the hydrogen gas process (more commonly known as water gas), had promising potential (Collins 1934).

The West 45<sup>th</sup> Street Gas Works was the Municipal Gas Light Company's first water gas plant to be constructed, using the Tessie du Motay production system. Portions of the MGP were completed in 1877, after which point customers began to receive water gas from the plant. The remainder of the works were completed in March 1878, but enlarged over the following months, so that by winter 1878, the MGP was producing three million cubic feet of gas each day (Collins 1934).

The 1879 Bromley map (Figure 9) and 1879 Taylor bird's eye view drawing (Figure 10) show the MGP's initial configuration. Landfilling at the western end of Blocks 1092 and 1093 had extended the shore to the line of what would become 12<sup>th</sup> Avenue, although in these images the street had not been laid out and the edges of the blocks were at the waterline. In 1879, Block 1092 contained five gas holders on the eastern end of the block, and four rectangular-shaped buildings on the western end of the block, shown on later maps to be a gasogene (or generator) house, a scrubber and engine house, a retort and condenser house, and a purifying and lime house and office. Block 1093 contained two gas holders on the southwestern side of the block and several unmarked buildings on the northwestern side of the block, shown on later maps as a retort house, carburetor, and purifying house. The iron foundry shown on the 1867 Dripps map remains on the block as well.

The 1880 Perris and Browne map (Figure 11) illustrates the enlarged configuration of the MGP. By this time, 12<sup>th</sup> Avenue had been laid out, and the map indicates the MGP had built a coal shed at the southwest end of Block 1092 that extended into the street and connected with an unloading area along the waterfront. Also illustrated on Block 1092 is a pump house at the northwest corner of the block, and two probable valve houses located between the gas holders. On Block 1093, a valve house is shown at the southeast corner of the MGP property and a naphtha tank at the northwestern end of the property. The map shows that the iron foundry had been demolished and in its place, a very large gas holder erected to replace an earlier one on the southern side of the block. A *New York Times* article dated June 18, 1880 describes construction of this gas holder, which at the time was alleged to be the largest of its kind in the world. The article explains that the holder's inner diameter was to be 185 feet, and the outer diameter 210 feet, with the height of the structure 48 feet. It was to hold 1,000,000 cubic feet of gas. As described below, by 1911 the holder had become approximately twice that height and capacity, and by 1930 nearly six times the original height and seven times the original capacity. The foundation of the holder was excavated into solid rock, requiring blasting activities that killed three men and injured four others on June 17, 1880, prompting the newspaper article.

During the mid-1890s, the West 45<sup>th</sup> Street Gas Works switched from the Tessie du Motay system to the more widely used Lowe system, necessitating a new configuration of the MGP structures. The 1890 Sanborn map (Figure 12) appears to show the MGP in the midst of its transformation from one production method to the other [note: Sanborn maps frequently were updated between editions by "pasting over" portions of existing maps. Thus, the 1890 map could represent the status of the area at any time from 1890-1898, as the next edition was published in 1899]. On Block 1092, changes included a pump house west of the purifying house, and eight underground naphtha tanks at the northwest corner of the property. On Block 1093, a purifying house had been built along the West 45<sup>th</sup> Street frontage, with another small tank to the north, and a stable and workshop had been constructed at the northwestern corner of the block. Of note, the structures designated retort house and purifying house on the

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1880 Perris and Browne map are now labeled storage and stables. All of the structures and property are attributed to the Consolidated Gas Company, the organization that was formed in 1884 and superceded the Municipal Gas Light Company, as well as five other local gas companies.

The 1899 Sanborn map (Figure 13) depicts the final configuration of structures for the Lowe system at the West 45<sup>th</sup> Street Gas Works. Block 1092 is shown as mostly the same as the 1890 edition, although the gasogene house is illustrated as having two coal intake conduits and now is connected directly to the scrubber and engine building where before they were discrete structures. New, small, unmarked tanks are shown near the naphtha tanks. On Block 1093, the storage building (formerly the retort house) had been removed and two small gas holders (labeled later as gas oil holders) constructed in its place. Several new small tanks also are shown northwest of the purifying house along West 45<sup>th</sup> Street, and near the waterfront within the 12th Avenue footprint. Last, several houses on Tax Lot 21 (located immediately adjacent to the large gas holder along West 45<sup>th</sup> Street) had been razed, following acquisition of the property by Consolidated Gas Company, and a storage house erected in their place.

The 1911 Sanborn map (Figure 14) indicates only a few changes from the previous edition, but provides additional details about some of the structures on the blocks. On Block 1092, the four large gas holders are labeled as 48 feet high, with a capacity of 375,000 cubic feet each. The smaller fifth holder is 37 feet high with a capacity of 130,000 cubic feet. On Block 1093, the smaller gas holder is labeled 37 feet high with a capacity of 130,000 cubic feet, while the large gas holder is labeled 80 feet high with a capacity of 2,000,000 cubic feet. The structure southeast of the large gas holder labeled a valve house on previous editions here is called an exhaust house. The two small gas holders on the 1899 Sanborn map are labeled here as gas oil holders (15 feet high with a capacity of 150,000 gallons each), and the tanks northwest of the purifying house are designated tar tanks.

The West 45<sup>th</sup> Street MGP operated until 1913, when all structures except the large gas holder and its exhaust house on Block 1093 were taken out of service and soon afterwards demolished. At this time, the western fourth of the two blocks was obtained by the City of New York for the reconfiguration of 12th Avenue in association with inland extension of the piers. The large gas holder and associated exhaust house on Block 1093 appear on the 1930 and 1950 Sanborn maps (Figures 15 and 16), although the holder's dimensions are labeled as 90 feet high with a capacity of 2,000,000 cubic feet in 1930, and 276 feet high and a capacity of 7,000,000 cubic feet in 1950. Pictures of the holder are included in Appendix C. A drawing of the holder on file at Con Edison's headquarters, made in 1962, indicates the holder is of the "waterless" variety. The drawing gives the dimensions of the holder as approximately 192 feet in diameter, 285 feet high, with 22 bays of about 26 feet each, and 5 galleries, giving a total capacity of 7,000,000 cubic feet. Supporting structures on the property included six oil tanks and pumps attached to the holder, and, moving counter-clockwise from the holder's southwest corner, a free-standing 10-foot high and 12-foot diameter oil storage tank able to hold 9,000 gallons, an oil skimmer tank of identical dimensions with an attached pump house, a rectangular-shaped "blow off tank" in a pit, a governor house (called the exhaust house on the Sanborn maps), an emergency oil pump house, and a switch house with associated storage sheds. The gas holder stayed in use until it was withdrawn from service in December 1965, and soon thereafter was demolished (document on file at Remediation Group, Con Edison).

## 5.4 POST-MGP OWNERSHIP AND USE

Con Edison no longer owns any of the former gas works property on Blocks 1092, 1093 or 1107, but retains use of part of Tax Lot 9 on Block 1093. The following discussion addresses use of these areas after most of the MGP was demolished in the mid-1910s, on a block-by-block basis. Sanborn maps (Figures 15 through 31) illustrate the sequence of development.

### Block 1092 (bounded by West 44<sup>th</sup> and West 45<sup>th</sup> Streets, 11<sup>th</sup> and 12<sup>th</sup> Avenues)

The former gas works site footprint includes modern Tax Lots 7, 16, and 49 on Block 1092, and the current alignment of 12<sup>th</sup> Avenue/West Side Highway to the west, which used to be part of the block before the roads were reconfigured.

After demolition of the MGP structures, Con Edison sold Tax Lot 7 to Republic Storage in 1922 for construction of a warehouse. This building, a multiple-story, reinforced concrete structure with a basement, was completed in 1923 and encompasses the entire Tax Lot. Sanborn maps show that the structure has been occupied by various tenants over time, and although somewhat modified since its initial construction, it still stands on the lot in its original location. Today it is used as a Manhattan Mini Storage facility (owner Edison West 44<sup>th</sup> Street Company).

In 1923, Con Edison sold Tax Lot 49 to F.L. Smythe Corporation for construction of a second warehouse, also covering the entire lot. Like the one bordering it to the south, this building is made of reinforced concrete, and has multiple stories and a basement level. Sanborn maps indicate various modifications and occupants over the building's use life; however, the footprint of the structure has not changed since its original construction. The current occupant is Time Moving and Storage (owners John Kevin Gilgan and Joseph P. Candella).

Con Edison sold Tax Lot 16 to Pennsylvania Greyhound Lines in 1943. Sanborn maps indicate the center portion of the Tax Lot contained various bus repair shops and storage structures (including pits under the concrete floor and a laundry) from the 1940s through the 1960s. Records on file at the Department of Buildings, New York, detail plans for a 1.5-story bus repair shop to be built in 1960 west of the initial repair shop structures erected in the 1940s. The plans describe that footings will be excavated to solid ground, which ranged from 15-30 feet below grade. One or more brick foundations remained on the lot from the MGP structures in this location (shown on an overlay map to be the four identically-sized gas holders in the middle of the block). The top of the brick foundations, which the new building was to sit over, were described as 10 feet below grade (DOB Bin #1080977). This new repair shop appears on the 1968 Sanborn map. Today, the bus repair shops have been demolished and the Tax Lot is owned and occupied by United Parcel Service. It is used as a parking lot and refueling center for UPS trailer-trucks.

The western portion of Block 1092 was obtained by the City of New York in the 1910s for reconfiguration of 12th Avenue/West Side Highway in association with inland pier extensions. The elevated West Side Highway was demolished north of West 43<sup>rd</sup> Street in 1989 (Hartgen 1994). Today, this former area of Block 1092 supports multiple-lane, at-grade roadways separated by a wide median strip.



### Block 1093 (bounded by West 45<sup>th</sup> and West 46<sup>th</sup> Streets, 11<sup>th</sup> and 12<sup>th</sup> Avenues)

The former gas works site footprint on Block 1093 includes Tax Lot 9 and a small portion of Tax Lot 21, as well as the current alignment of 12<sup>th</sup> Avenue/West Side Highway to the west, which used to be part of the block before the roads were reconfigured.

As described in Section 5.1, Con Edison retained ownership of Lot 9 until 2000, when it was acquired by the NYSDOT through eminent domain for future use as a bus parking lot and pedestrian bridge to the Intrepid Sea, Air, and Space Museum across 12th Avenue. Until the mid-1960s, the property contained a large gas holder and several small associated structures. After these structures were demolished, the Tax Lot was used by Con Edison for heavy equipment storage and a parking lot. Sanborn maps show the property to be either vacant or designated a parking lot through the mid-1990s. In 1995, Con Edison constructed a natural gas refueling station on the northeast corner of Tax Lot 9, which remains in use today. The northwest corner of Tax Lot 9 currently is under excavation for installation of a pre-cast concrete form, presumably associated with the construction of the pedestrian bridge to the Intrepid Sea, Air, and Space Museum.

The portion of Tax Lot 21 formerly owned by Con Edison and used as a storage shed was sold during the 1920s. Sanborn maps from 1930 through the 1990s show that this portion of the property has been vacant and used for parking, a function it retains today.

Like Block 1092 to the south, the western portion of Block 1093 was obtained by the City of New York in the 1910s for reconfiguration of 12th Avenue/West Side Highway in association with inland pier extensions. The elevated West Side Highway was demolished north of West 43<sup>rd</sup> Street in 1989 (Hartgen 1994). Today, this former area of Block 1093 supports multiple-lane, at-grade roadways separated by a wide median strip.

### Block 1107 (waterfront west of Blocks 1092 and 1093)

The same action that necessitated truncating Blocks 1092 and 1093 for reconfiguration of 12th Avenue and the West Side Highway involved altering the layout of Block 1107. In order to accommodate longer ships along the Hudson River waterfront, it was necessary to extend the existing piers inland, as stretching them further into the river would have impeded navigation. Therefore, much of Block 1107, which had been reclaimed during the last quarter of the nineteenth century by placing fill behind a bulkhead wall, was reexcavated to make room for the longer ships. The water line is now approximately 250 feet further inland than it was at the beginning of the twentieth century. The only portions of Block 1107 once used by the MGP still in existence are parts of Piers 68 and 69 (presently named City-21 and City-30 on the tax map 21) and the shoreline immediately adjacent to them; the rest is now under water once again.

## **5.5 SUMMARY**

Tables 5.1 and 5.2 present a summary of the significant property transfers on Blocks 1092 and 1093 which occurred during the formation of the West 45<sup>th</sup> Street Gas Works, during the operations of the Gas Works, and the dissolution of the Gas Works after 1913.

**Table 5.1 Block 1092 – Property Transfers**

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/Grantee	Comments
1878	1-27 and 41-64	William and Alice Menzies	Municipal Gas Light Co.	Now parts of Tax Lots 7, 16, 49, and 12 <sup>th</sup> Ave. and West Side Highway.
1884	Additional parcels in current Tax Lot 16.	Other individuals	Municipal Gas Light Co.	Parcels added to current Tax Lot 16.
1885	Tax Lots listed above.	Municipal Gas Light Co.	Consolidated Gas Co.	Consolidated Gas Co. organized in 1884.
1880s-1890s	Remaining lots in current Tax Lot 16.	Various	Consolidated Gas Co.	Consolidation of outstanding lots in Block. 1092 Lot 16.
1913	Western portion of Block 1092	Consolidated Gas Company	City of New York	Roadway reconfigurations. Gas Works shut down.
1922	Tax Lot 49	Consolidated Gas Co.	Republic Storage Co.	Current location of Time Moving and Storage warehouse.
1923	Tax Lot 7	Consolidated Gas Co.	F.L. Smithe Corp.	Current location of Manhattan Mini Storage.
1943	Tax Lot 16	Consolidated Edison Co.	Pennsylvania Greyhound Lines, Inc.	Bus repair shop.
1969	Tax Lot 16	Greyhound Lines, Inc.	North Quarter Corp.	Currently used by UPS.

**Table 5.2 Block 1093 – Property Transfers**

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/Grantee	Comments
1877	1-16 and 53-64	William and Alice Menzies	Municipal Gas Light Co.	Now part of Tax Lot 9, 12 <sup>th</sup> Ave., and West Side Highway.
1878-1887	Additional parcels (17-20 and 46-52) in current Tax Lot 9	Other individuals	Municipal Gas Light Co. and Consolidated Gas Co.	Parcels added to current Tax Lot 9. Gas works began operations.
1891 and 1892	3 small lots now part of Tax Lot 21	Other individuals	Consolidated Gas Co.	Adjacent properties added to Gas Works site.
1913	Western portion of Block 1093	Consolidated Gas Co.	City of New York	Roadway reconfigurations. Gas Works shut down.
1965	Remaining portion of Tax Lot 9.	NA	NA	Large gas holder operated by Con Edison until 1965. Demolished holder in late 1960s.
2000	Tax Lot 9	Consolidated Edison	New York State	NYSDOT plans to develop site for bus parking and pedestrian footbridge to Intrepid Sea, Air and Space Museum. Con Edison is still using a portion of the site temporarily.

## SECTION 6

### PAST SITE OPERATIONS

#### 6.1 INTRODUCTION

This section describes the operations conducted at the former West 45<sup>th</sup> Street Gas Works in addition to significant operations conducted before and after the Gas Works. This section is divided into three parts; pre-Gas Works operations, Gas Works operations, and Post Gas Works operations. Information used to develop the operational history was obtained from:

- Consolidated Edison internal records and files (including Remediation files and reports, Real Estate records, in-plant property records, and historical photographs),
- Consolidated Edison personnel interviews,
- Historical maps, including Sanborn Fire Insurance Maps, Dripps Maps, Perris and Browne Insurance Maps, Bromley Atlases, and Taylor City Map,
- Books and articles detailing manufactured gas company histories and operating procedures,
- Manufactured gas industry publications (including the *American Gas Light Journal*, in later years called the *American Gas Journal*),
- Brown's Directory of American Gas Companies,
- Public Service Commission (PSC) reports,
- Nineteenth and twentieth century newspaper and journal articles (such as the *New York Times*), and
- Environmental studies undertaken within and adjacent to the properties.

#### 6.2 PRE-GAS WORKS OPERATIONS

##### 6.2.1 Summary of Pre-Gas Works Operations

Prior to the existence of the West 45<sup>th</sup> Street Gas Works, Blocks 1092 and 1093 supported a variety of structures. Historic maps and tax assessment records indicate that Block 1092 contained a number of houses during the 1850s-1870s, as well as a saw mill located along the former shoreline. Block 1093 also contained various houses from the 1850s-1870s. Several industrial operations existed on the block as well: a cow hide whip and sand paper factory appears on the 1852 Dripps map (Figure 6), and an iron foundry is depicted in roughly the same location on the 1871 Perris and Browne map (Figure 8) and 1879 Bromley map (Figure 9). Both of these structures were located within the footprint of the former gas works site. The Municipal Gas Light Company, which purchased the property that would become the West 45<sup>th</sup> Street Gas Works, originally was organized as the New York Oxygen Gas Company. The companies implemented the oxygen gas process, but this proved financially untenable, and as a result the founders had to sell their assets and patent rights at a sheriff's sale in 1873. The buyer founded

the Municipal Oxygen Gas Company in May 1874. The company acquired not only the two 1867 patents, but a second Tessie du Motay patent from 1869. In the winter of 1875-76, Graham sold a controlling interest of the company to financier Charles Francklyn, who changed the name of the organization to the Municipal Gas Light Company and implemented the hydrogen gas process (more commonly known as water gas) (Collins 1934). Other operations on the block included some landfilling associated with shoreline extension prior to the MGP's construction (although the Municipal Gas Light Company completed the process in the late 1870s). Figures 4 through 8 illustrate the changing position of the shoreline during this period.

## **6.2.2 Pre-Gas Works Wastes and Byproducts**

Little information is documented about the wastes and byproducts generated and the waste handling practices used by the various operations that were conducted on the properties before the Gas Works began operations in 1887. Potential wastes generated may include tanning chemicals used at the cow whip factory, adhesives used at the sand paper factory, and oils and grease lubricants used at the former saw mill. The iron foundry likely used coal or coke as a source of energy for melting the heating the iron. The coal and the coal ash would be potential sources of metals and polynuclear aromatic hydrocarbons (PAHs). If iron were also produced from iron ore at the foundry, the iron ore would be an additional source of metals. The disposal practices for the coal ash, cinders, and possible slag is unknown. It is unknown what byproducts were produced in the oxygen gas processes that predate the coal gassification using the water gas processes.

## **6.3 MGP OPERATIONS**

### **6.3.1 Summary of Site Gas Production**

The processes and practices described in the following sections are inferred from historic maps, Con Edison records, Collins (1934), Hartgen (n.d.), Public Service Commission (PSC) Records, Brown's Directories, E.P.A. (1985), Wolfe (1934), Downing (1934), Stewart (1958), and Nisbet-Latta (1907).

The West 45<sup>th</sup> Street Gas Works manufactured water gas from 1877-1913 (Collins 1934; PSC 1913). The initial operation of the plant used the Tessie du Motay process, for which the Municipal Gas Light Company owned the patent (Collins 1934; Brown's Directory 1889-1899). The Perris and Browne map of 1880 (Figure 11) illustrates the site configuration for this process. Coal was unloaded at the dock across 12th Avenue, fed through conduits to the coal shed, then used in the gasogene house (or generator house) for the initial blast cycle. Because this process was not continuous, the West 45<sup>th</sup> Street Gas Works had two sets of carburetors and retort houses (one on each block), where the hydrogen gas produced in the generator house was piped to be fixed. From there, the gas was piped through scrubbers, condensers, and purifiers (one on each block) to remove byproducts such as tar, then was piped to the nearby gas holders to await distribution. Due to very real fears of explosions, the Tessie du Motay system utilized separate buildings for different processes. While this cut down on dangerous conditions and likely prevented many serious accidents, ultimately it was not energy efficient, as the heat could not be conserved between stages of the process (Wolfe 1934; Hartgen n.d.).

By the mid-1890s, the West 45<sup>th</sup> Street Gas Works had switched to the Lowe process of manufacturing water gas (Brown's Directory 1898-1899; PSC, 1907). This setup, which became widely used in the United States during the late nineteenth and early twentieth centuries, introduced a spray of gas oil during the carbureting phase to create an oil gas, which then passed through a superheater to crack, or break down, the long gas molecules into shorter molecules that would not separate out of the gas mixture. Lowe's process also utilized a combined generator/carburetor/superheater, which the Tessie du Motay system did not. By using fewer structures, the energy efficiency of the overall process increased. The Sanborn maps for 1890, 1899, and 1911 (Figures 12 through 14) illustrate how the West 45<sup>th</sup> Street Gas Works was altered from the Tessie du Motay process to the Lowe process. Most significantly, the maps show how the MGP either reused and retrofitted existing structures (mainly on Block 1092) or demolished and rebuilt new structures (on Block 1093) to match the needs of the Lowe system. The presence of gas oil tanks on Block 1093 by the 1899 Sanborn edition is a clear indication of the new process. Of note, the maps do not indicate which building housed the combined generator/ carburetor/superheater, but PSC reports indicate that six sets (four of one size and two of another size) existed at the MGP during the early twentieth century (PSC, 1908). Comparing the sizes of the machines at the West 45<sup>th</sup> Street Gas Works (which were manufactured by the United Gas Improvement Company, according to the PSC reports) with the apparatus specifications given by the manufacturer (Nisbet-Latta, 1907), the Gas Works were using the largest capacity models available at the time.

Water gas production quantities were listed in PSC reports beginning in 1907 (although not published for 1908-1910). A summary of available information on gas production for the West 45<sup>th</sup> Street Gas Works, prior to its shutdown in 1913, is presented in Table 6.1. At this time, there were three water gas plants operated by the Consolidated Gas Company in New York City. The West 45<sup>th</sup> Street Gas Works had the capacity to produce about 20% of all water gas manufactured by the company (PSC, 1907).

**TABLE 6.1**

**GAS PRODUCTION AT THE WEST 45<sup>TH</sup> STREET GAS WORKS (PSC REPORTS)**

<b>Year</b>	<b>Total Yearly Production</b>	<b>Daily Plant Capacity</b>	<b>Daily Average Production</b>	<b>Total Holder Capacity</b>
1907	1,058,741,000 (6 months only)	8,500,000 cu. ft.	5,754,000 cu. ft.	3,500,000 cu. ft.
1911	2,658,157,000	8,500,000 cu. ft.	7,283,000 cu. ft.	3,500,000 cu. ft.

**6.3.2 Process Configurations**

As described above, water gas was produced at the West 45<sup>th</sup> Street site between 1877-1913. Raw materials (coal and oil) were delivered by barge and unloaded at the nearby Hudson River piers, and may also have been delivered by rail, as tracks ran along 11<sup>th</sup> Avenue less than one block away. It is possible that by-products may have been shipped off-site by rail. Coal appears to have been transferred directly from barges at the wharf across 12th Avenue to the plant's coal shed at the southwest corner of Block 1092 via subsurface conduits, as shown on Sanborn maps.

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In the Lowe carburetted gas process, blue gas was produced by passing steam over incandescent coke, producing carbon monoxide and hydrogen. To maintain proper temperatures for this reaction to occur, air was periodically passed through the coke bed to combust the coke. During the air blast cycle, the temperature of the coke bed was increased. To prevent the gas from becoming contaminated with excessive nitrogen or carbon dioxide from the burning coke, the steam addition and combustion blast steps were cycled. During the steam cycle, water vapor was injected and the water vapor reacted with the coke bed to form carbon monoxide, hydrogen, and carbon dioxide.

The blue gas and steam were forced from the combustion chamber and into a series of carburetter chambers by fan blowers. For the Lowe process, as the gas passed into the carburetter, oil was sprayed into the chamber to form oil gas, which was then cracked. Naphtha was commonly used as the carburettion oil in the early 1900s. Naphtha was later used in plant internal combustion engines and heavier petroleum fractions were used for carburetted gas production.

The cracked gas was then passed from the carburetter into the superheater for fixing and final amalgamation. The gas was then passed into a condenser and scrubber to remove tars, light oils, and ammonia liquor from the gas. The gas was then pumped into a relief holder to cool. The smallest holders shown on each block likely were the relief holders, as their capacities do not appear in the PSC reports for gas holders. The tar and ammonia liquor typically passed into an underground “tar well or tar pit”. The “tar wells or pits” were used for the removal of gasses from the tar and ammonia liquor and cooling. The ammonia liquor was then pumped into a cistern where the ammonia liquor was recovered using gravity separation. No tar wells or cisterns were identified on the historical maps and figures. Coal tar tanks were located on the west end of Block 1092 in the 1911 Sanborn map. Earlier Sanborn maps (1880 and 1889) identify the tanks as naphtha tanks. This area is presently under 12th Avenue and the West Side Highway.

The gas was passed from the relief holder through a purifying apparatus. A purifying apparatus usually consisted of concrete vessels filled with wood chips coated iron oxide. The iron oxide purifiers removed sulfur prior to distribution of gas to the customers. When exhausted, the iron oxide purifier material was regenerated through exposure to air, producing iron oxide and sulfur. Eventually, the purifier material (oxide chips) was fouled by the accumulation of sulfur, tar and ferrocyanides. The iron oxide purifier material was replaced with fresh purifier material. The purifier material usually consisted of clean gray iron borings free from steel, brass, and other metals. Small amounts of crystal rock salt were added, as often were rosin and gum-free wood shavings. The presence of a lime house adjoining the purifier house on Block 1092 (1880 Perris and Brown map – Figure 11, 1890 Sanborn map – Figure 12, and 1899 Sanborn Map – Figure 13) indicates that lime purification processes were used. The lime removed moisture, sulfur compounds, carbon dioxide, and carbonic acid.

Gas was finally passed through a meter and into the distribution holders. At the West 45<sup>th</sup> Street Gas Works, Block 1092 had four brick holders, each with a capacity of 375,000 cubic feet, and a smaller holder with a capacity of approximately 184,000 cubic feet, and Block 1093 had one large brick holder with a capacity that seemed to increase over time, and a smaller gas holder with a capacity of approximately 186,000 cubic feet. The *New York Times* in 1880 said the

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capacity of the larger holder was 1,000,000 cubic feet, while the 1911 and 1930 Sanborn maps and the 1907-1911 PSC report indicated the capacity was 2,000,000 cubic feet. After the MGP closed, the larger gas holder on Block 1093 was altered to hold 7,000,000 cubic feet (Sanborn 1950). Occasionally, the base of the holders required cleaning. Typically, a basket-shovel was employed to remove some of the mud and muck. The remaining mud and tar was pumped out (Nisbet-Latta 1907). Water was added to the bottom of the gas holders after cleaning. The large gas holder was the waterless type.

### **6.3.3 By-Products and Waste Disposal**

A complete record of by-product quantities, reuse, sale, and disposal is not available. Although PSC reports list individual plant tar production, tar sales, coke production, and coke sales, the earliest year that this information was published was 1920, well after the West 45<sup>th</sup> Street Gas Works had closed. During the period that the West 45<sup>th</sup> Street Gas Works operated, PSC reports summarize byproduct output and sales for entire corporations only. For the Consolidated Gas Company, the PSC report indicates water gas plant raw materials were coal, coke, gas oil, lime, and oxide. Oil tar is listed as a residual, and was offered for sale. For oil tar at all three water gas plants from June 1906 through June 1907 (of which the West 45<sup>th</sup> Street plant produced approximately 20% of the company's total capacity), 166,546 gallons were on hand in June 30, 1906 and 128,505 gallons were on hand in June 30, 1907; 8,028,380 gallons were made, 4,556,847 gallons were used, and 3,509,574 gallons were sold (PSC 1907).

Written information regarding waste or excess by-product disposal is not available. It is not known if purifier waste (usually iron oxide and spent lime) was stockpiled prior to or after use on-site. The disposal history of purifier waste is unknown.

## **6.4 POST-MGP OPERATIONS**

Section 5.4 describes the history of the West 45<sup>th</sup> Street Gas Works site footprint after the property was sold to other owners. The following is a summary of the post-MGP operations, on a block-by-block basis.

### **6.4.1 Block 1092**

The portion of this block not truncated by roadway reconfiguration includes Tax Lots 7, 16, and 49. The entire expanse of Tax Lots 7 and 49 have, since 1923, contained multiple-story (with basement), reinforced concrete buildings used primarily as warehouses or storage. Tax Lot 7 overlies the area of the MGP formerly containing portions of the generator house, condenser, and engine house, as well as parts of the purifying house, office and meter house, and fire pump (Sanborn 1911). Tax Lot 49 overlies the area of the MGP formerly containing portions of the retort house and the purifying house (Sanborn 1911). Since both existing buildings have basements, it is likely that the majority of the former gas works structures and the original ground surface have been removed.

Portions of Tax Lot 16 contained bus repair shops and storage structures (including pits under a concrete floor and a laundry) from the 1940s through the 1960s. The remainder of the tax lot has been used for bus or truck parking. Gasoline pumps and underground storage tanks have existed on portions of the property at various points after demolition of the MGP. UPS



currently maintains both pumps and USTs on the lot. This Tax Lot overlies the former location of the five gas holders. As described in Section 5.4, one portion of the lot was excavated to the brick foundation of the holders (at about 10 feet below grade) for new construction, while footings for the same structure were excavated to solid ground, noted ranging from 15-30 feet below grade. It is probable portions of the gas holders still exist beneath the parking lot, in areas where later structures or USTs have not been constructed.

The eastern end of Block 1092 (Tax Lots 29-36), along 11<sup>th</sup> Avenue, is outside the former gas works footprint. These lots contain various multiple-story buildings, most with basements.

The western end of original Block 1092 currently is under 12th Avenue and the West Side Highway. This section of the block once contained portions of the generator house, retort house, coal shed, and various scrubber and coal tar tanks. It is likely parts of these structures are extant below parts of the roads, although reconstruction of Route 9A and installation of various utilities may have destroyed some of these resources.

#### **6.4.2 Block 1093**

The former gas works site footprint on this block not truncated by roadway reconfiguration includes Tax Lot 9 and a small portion of Tax Lot 21. Until 1965, Tax Lot 9 contained a large gas holder and associated structures, including a governor house. After the holder was taken out of service and demolished, the property was used by Con Edison as a heavy equipment storage facility, a parking lot, and a natural gas refueling station. The natural gas station was built in 1995, and remains on the lot today. Excavation currently is underway at the northwest end of the lot for installation of a pre-cast concrete structure. It is likely that the southern half of Tax Lot 9, which has not been subjected to large-scale soil removal, retains subsurface elements of the large gas holder and its associated structures.

Con Edison formerly owned a small part of Tax Lot 21, at the southeast boundary of Tax Lot 9. This property once contained a storage shed, which is now demolished. The property has been used as a parking lot since that time.

During the late nineteenth and twentieth centuries, the remainder of the block (outside the MGP footprint) has contained a variety of single level and multiple-story buildings (some with basements) and parking lots. The Standard Oil Company had a distribution station on part of Tax Lot 21, which appears on the 1890, 1899, and 1911 Sanborn maps (Figures 12 through 14). The Standard Oil distribution station could have had spills leaks of petroleum products. Of note, a number of automobile repair shops have existed on this portion of the block, some of which remain today. The automobile shops could have spilled or released petroleum products, used oil that may contain residual metals, degreasing compounds, paints, and solvents. Later operations could have used chlorinated degreasers and solvents.

As with Block 1092 to the south, the western end of original Block 1093 now lies under 12th Avenue and the West Side Highway. Portions of the former gas works under this area include the retort house, carburetter, purifying house, and smaller gas holder shown on the 1880 Perris and Browne map (Figure 11), the purifying house along West 45<sup>th</sup> Street and the naphtha house to the north, shown on the 1890 Sanborn map (Figure 12), and the gas oil tanks, machine shop, oil storage structure, and tar tanks shown on the 1899 and 1911 Sanborn maps (Figures 13

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and 14). Remaining remnants of the former gas works were not observed but may exist in the subsurface below 12th Avenue and the West Side Highway.

### 6.4.3 Block 1107

The only parts of Block 1107 that are extant after inland extension of the Hudson River piers are the eastern ends of Piers 84 and 86 and the shoreline immediately adjacent to them. This area was once under the Hudson River; all soil is imported fill.

## 6.5 SUMMARY OF OPERATIONAL HISTORY

Tables 6.2 through 6.5 present a summary of the progression of the significant operations conducted on each of the tax lots that comprised the former West 45<sup>th</sup> Street Gas Works. Details of the operations and historical progression have been presented in Sections 6.1 through 6.4.

**Table 6.2 Block 1092 Tax Lot 7**

Year	Usage	Owner	Comments
Pre-Gas Works	Saw Mill	William Menzies	Saw mill shows on historical maps beginning 1867.
1877-1913	Gas Works	Municipal Gas Light Co. then Consolidated Gas Co. of NY	Main structures were a generator house, condenser, engine, and purifying house.
1923-Present	Warehousing	First owner (F.L. Smithe Corp.) current owner (44 <sup>th</sup> Street Holdings LLC)	Currently Manhattan Mini Storage multi-floor building. Building built after Gas Works and appears to have a basement.

**TABLE 6.3 BLOCK 1092 TAX LOT 16**

<b>Year</b>	<b>Usage</b>	<b>Owner</b>	<b>Comments</b>
Pre-Gas Works	Vacant and houses	Various	Vacant land east of a sawmill. Housing on eastern part of Block.
1877-1913	Gas Works	Municipal Gas Light Co. then Consolidated Gas Co. of NY	Main structures were gas holders.
1943-1969	Greyhound Bus Repair and Laundry	Pennsylvania Greyhound Lines, Inc.	Service building with pits and parking, laundry and some storage. Post gas works excavation for building and USTs.
1969-Present	UPS Parking Lot	North Quarter Corp.	UPS currently occupies Lot 16. The start date is undetermined. USTs present.

**Table 6.4 Block 1092 Tax Lot 49**

<b>Year</b>	<b>Usage</b>	<b>Owner</b>	<b>Comments</b>
Pre-Gas Works	Saw Mill	William Menzies	Saw mill shows on historical maps beginning 1867.
1877-1913	Gas Works	Municipal Gas Light Co. then Consolidated Gas Co. of NY	Main structure were a retort house, pump house, and purifying house.
1923-Present	Warehousing	First owner Republic Storage Co. (current owners John K. Gilgan and Joseph P. Candella)	Currently Time Moving and Storage a multi-floor building. Building built after Gas Works and appears to have a basement.

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**Table 6.5 Block 1093 Tax Lot 9**

<b>Year</b>	<b>Usage</b>	<b>Owner</b>	<b>Comments</b>
1852	Cow Hide Whip and Sand Paper Factory	Unknown	Pre-Gas Works factory.
1871	Iron Foundry	Unknown	Pre-Gas Works factory.
1877-1913	Gas Works	Municipal Gas Light Co. then Consolidated Gas Co. of NY	Major structures include purifying house, gas holders and gas/oil tanks
1913-1965	Gas Holder	Con Edison	Site of large gas holder.
1965-2000 2000-present	Equipment parking, vehicle parking, natural gas refueling station.	Con Edison ownership transferred to State of New York in 2000.	Con Edison uses northern half of Lot 49 but has plans to vacate. NYSDOT uses southern half of Lot 49. Construction activities on southern half for Route 9A project and pedestrian bridge.

## SECTION 7

### ENVIRONMENTAL/REGULATORY AGENCIES AND DATABASES

#### 7.1 EDR PROFILE SEARCH

A search, of standard environmental records sources maintained by Federal and State regulatory agencies, was conducted by Environmental Data Resources, Inc. (EDR) on March 14, 2002. The complete findings are presented in the EDR report in Appendix B. All sites identified in the EDR search report are at equal or higher elevations than the West 45<sup>th</sup> Street site.

#### **Mappable Sites:**

Mappable sites in the vicinity of the West 45<sup>th</sup> Street site were identified on the area map provided in the EDR profile search. A summary of environmental database findings is presented in Table 7.1. A list of acronyms and definitions are included in the database search report in Appendix B.

The database search identified 12 large quantity and 20 small quantity sites where hazardous wastes are generated, transported, stored, treated, and/or disposed within 0.25 miles of the site. Fifty-two leaking tanks and 28 underground storage tanks were identified within 0.5 and 0.25 miles of the site respectively. One chemical bulk storage UST and three above ground chemical bulk storage tanks were identified within 0.25 miles of the site. The leaking tanks identified within 0.25 miles of the site have the potential to impact the site depending on the ages of the releases, types of releases, quantities of releases, and distances from the site. Current releases and associated impacts from the other sites listed have not been identified. Releases and associated impacts from these other sites described above would have the potential to impact the site if a release occurred.

It is also noteworthy that the EDR Proprietary Historical Databases revealed three coal gas sites within one mile of the site. The first location is owned by Consolidated Gas Works and is located on the western side of 11<sup>th</sup> Avenue between 44<sup>th</sup> Street and 46<sup>th</sup> Street. The site also extends to 12<sup>th</sup> Avenue. The second site is owned by the Consolidated Gas Company and is located on the eastern half of the block formed by 42<sup>nd</sup> Street, 11<sup>th</sup> Avenue, and 41<sup>st</sup> Street. The site consisted of gas holders and purifying buildings. The third site is owned by the Equitable Gas Company and is located between 59<sup>th</sup> Street and 58<sup>th</sup> Street and between Amsterdam Avenue and West End Avenue. This site consisted of gas holders.

**Table 7.1 Summary of Environmental Database Findings (Mappable Sites)**

<b>Jurisdiction</b>	<b>Program Database</b>	<b>Radius (Miles)</b>	<b>Number of Sites</b>	
<b>Federal</b>	NPL – National Priority List	1	0	
	Proposed NPL – Proposed NPL Site	1	0	
	CERCLIS – Comprehensive Environmental Response, Compensation, and Liability Information System	0.5	0	
	CERC-NFRAP – CERCLIS No Further Action Planned	0.25	0	
	CORRACTS – Corrective Action Report	1	0	
	RCRIS-TSD – Resource Conservation and Recovery Information System	0.5	0	
	RCRIS (Lg. Gen.) – RCRIS Large Quantity Generator	0.25	12	
	RCRIS (Small Gen.) – RCRIS Small Quantity Generator	0.25	20	
	<b>Federal Supplemental</b>	CONSENT – Superfund (CERCLA) Consent Decrees	1	0
	ROD – Record of Decision	1	0	
	Delisted NPL – NPL Deletions	1	0	
	MINES – Mines Master Index File	0.25	0	
<b>State</b>	SHWS – Inactive State Haz. Waste Disposal Sites in NYS-	1	0	
	SWF/LF – Facility Register	0.5	0	
	LTANKS – Leaking Storage Tank Incident Report Filed	0.5	52	
	UST – Underground Storage Tank Database	0.25	28	
	CBS UST – Underground Chemical Bulk Storage Tank	0.25	1	
	MOSF AST – Major Oil Storage Facilities Database	0.5	0	
	VCP – Voluntary Cleanup Agreement	0.5	0	
	SWTIRE – Registered Waste Tire Storage & Facility List	0.5	0	
	SWRCY – Registered Recycling Facility List	0.5	0	
	<b>State/Local Supplemental</b>	HSWDS – Hazardous Substance Waste Disposal Site Inventory	0.5	0
		CBS AST – Above-ground Chemical Bulk Storage Tank	0.25	3
	MOSF AST – Major Oil Storage Facilities Database	0.5	0	
<b>EDR Proprietary</b>	Coal Gas – Manufactured Gas (Coal Gas) Site	1	3	

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## Unmappable Sites (Zip code ID)

Unmappable sites were identified on New York and Federal databases. The sites were not mappable because the addresses provided to EDR by regulatory agencies were incomplete. The unmappable sites were identified by zip code, city name or county. Details on the unmappable sites are provided in the EDR Search Report in Appendix B and summarized in Table 7.2.

**Table 7.2 Summary of Environmental Database Findings (Unmappable Sites)**

<b>Jurisdiction</b>	<b>Program Database</b>	<b>Radius (Miles)</b>	<b>Number of Sites</b>
<b>Federal</b>	RCRIS-SQG, FINDS – Facility Index System		2
	FINDS, RCRIS-LQG		1
<b>State</b>	SHWS		4
	LTANKS		2
	NY Spills, LTANKS		1
	CBS AST		1

## 7.2 ADDITIONAL RECORDS SOURCES

Files at Con Edison and the Department of City Planning were searched for records of additional sites and results of sampling. A freedom of information request was filed with the NYSDEC that requested information on sites within the investigation area.

The western end of Block 1093 Lot 9 was sampled by Con Edison in 1997 and Allee, King, Rosen, & Fleming in 1998 as part of evaluations for property transfer for the Route 9A Reconstruction Project. Con Edison obtained soils from four test pits. The analytical results using the Resource Conservation and Recovery Act (RCRA) Toxicity Leaching Procedure (TCLP) method found traces of benzene at 0.004 mg/L and barium at a concentration of 0.78 mg/L. Total petroleum hydrocarbons were detected at concentrations ranging from 20 ppm to 7,400 ppm. Allee, King, Rosen, & Fleming, Inc. conducted sampling in 1998 for the State of New York that included Tax Lot 9 in Block 1093. Benzene, toluene, ethylbenzene and xylene (BTEX) and semivolatile organic compounds were detected in soil samples. Lead was detected at concentrations ranging from 1,140 mg/L to 2,510 mg/L and was the only metal to exceed the TCLP threshold level (5.1 mg/L and 12.6 mg/L). Groundwater was also sampled. BTEX was detected in groundwater at concentrations ranging from 3.7 ug/L to 236.8 ug/L. SVOCs were detected at 4.1 and 5 ug/L. Many metals exceeded NYSDEC groundwater standards. Lead concentrations ranged from 57 ug/L to 2,860 ug/L. TPH ranged from 1,300 ug/L to 5,900 ug/L. Due to the presence of impacts in the soils and groundwater, the impacted area constituted a recognized environmental condition (Foster Wheeler, 1998).

## SECTION 8

### POTENTIAL RECEPTORS

#### 8.1 SENSITIVE AREAS

Based upon the site reconnaissance conducted on April 10, 2002 and data reviews, sensitive areas and potential receptors were identified. Table 8.1 presents potential sensitive areas and possible receptors within 0.25 miles and Table 8.2 identifies possible pathways leading to impact.

**TABLE 8.1 POTENTIAL SENSITIVE RECEPTORS AND AREAS**

Sensitive Receptors (Human)	Distance From Site (miles)	Comments
Schools	<0.25	PS 51 Elias Howe School
Day Care Facilities	NA	None identified.
Parks	0.25	Playground between 9 <sup>th</sup> and 10 <sup>th</sup> Ave between 45 <sup>th</sup> and 46 <sup>th</sup> Street.
Libraries or Community Organizations	NA	None Identified
Tourist Attractions	<0.25	Intrepid Sea, Air, and Space Museum. Part of former Gas Works site planned for parking and foot bridge to museum.
<b>Sensitive Receptors/Habitats</b>		
Waterbodies	<0.25	Hudson River
Wetlands	<0.25	Wetlands around piers in Hudson River.
<b>Surrounding Land Use</b>		
Residential Only	NA	
Mixed Residential and Commercial/Industrial	<0.25	High rise and multi-family housing and commercial/industrial usage. 4,457 residents in general vicinity of site (Census 2000).
Commercial/Industrial Only	NA	



**Table 8.2 Potential Exposure Pathways**

<b>Pathway</b>	<b>Possible Exposure Yes/No</b>	<b>Comments</b>
<b>Soils</b>		
Exposed Ground Surface	No	Most surfaces paved or occupied by buildings.
Subsurface	Yes	Excavators & site workers. Previous sampling indicated subsurface soils contained concentrations of BTEX, SVOCs, barium, lead, and TPH.
Seeps/Vapors	Yes	Buildings have basements. Residues, if present, could seep into basements along with shallow groundwater, or as vapors.
<b>Surface Water</b>		
	<b>Miles</b>	<b>Comments</b>
Distance to Surface Water	<0.25 miles	Site runoff could reach the Hudson River via storm sewer discharges.
Distance to Surface Water Intakes	NA	No known intakes.
Distance to Wetlands	>0.5 miles <0.25 miles	The nearest Federal wetland is in Central Park 3,000 feet to the northeast. The EDR report also shows wetlands adjacent to the piers approximately 200 feet west of the site.
Contaminated Runoff Potential	No	Site is paved and occupied with buildings. Contaminated runoff could occur during excavation if excavated soils are uncovered and runoff is not controlled.
<b>Groundwater</b>		
Groundwater Used for Drinking in Manhattan?	No	Area is in the NYC water supply area supplied by upstate reservoirs. Groundwater not used for drinking in Manhattan.
Drinking Water Wells	>12 miles	The nearest known drinking water wells are in the Jamaica-Queens Water Supply on Long Island. No potential impacts from the West 45 <sup>th</sup> Street site because of separation by the East River and groundwater divide. The public water system site identified in the EDR report is actually located upstate in Liberty, NY. The supply owner resides in the vicinity of the site.
Depth to Aquifer Used for Drinking	NA	No drinking water aquifers used in site vicinity.

## SECTION 9

### DISCUSSION AND CONCLUSIONS

#### 9.1 DISCUSSION AND CONCLUSIONS

The following conclusions are based on the historical research and site reconnaissance visit to the former West 45<sup>th</sup> Street Gas Works:

- Industrial activities were conducted in the vicinity of the former West 45<sup>th</sup> Street Gas Works prior to the construction of the Gas Works. Industries identified included an iron foundry, a sawmill, a cowhide whip and sandpaper factory.
- The former West 45<sup>th</sup> Street Gas Works operated from 1878 through 1913 on portions of City Blocks 1092 and 1093. Production of coal gas using the water gas process began at the site in 1878 by the Municipal Gas Company and were continued by the Consolidated Gas Company formed in 1884. The MGP continued to produce gas from coal until 1913. Operations were discontinued in 1913 when the City of New York obtained the western portions of the two blocks of the reconfiguration of 12th Avenue and the inland extension of the piers. Con Edison continued to operate a large gas holder on Block 1093 until 1965. The various site structures were demolished soon after the operations stopped in 1913 and 1965.
- Various lots from the former gas works were sold beginning in 1922 and new structures were built on portions of the site after the MGP structures were razed. The disposition of wastes and byproducts generated by the former gas works are not well documented. The disposition of the materials from the razed structures is also not well documented. The area west of the former gas works was filled during the years the MGP operated. The nature and source of the fill material is unknown. The fill was later excavated for the inland expansion of the piers. The disposition of the excavated material is unknown.
- Based on the site reconnaissance and historical research, there are no remaining structures associated with the former gas works, with the exception of stone and mortar retaining walls built around elevated platforms that once supported the gas holders. These elevated areas are presently paved and used for parking by Con Edison, NYSDOT, and UPS. No visual evidence of impacts or MGP residuals were observed during the site reconnaissance visit. However, site access was limited to sidewalks and public areas.
- Areas of the site that have not had significant excavation and building may retain remnants of the former MGP structures and may contain possible MGP residuals.
- The area of the former West 45<sup>th</sup> Street Gas Works is a mixed use area with commercial, manufacturing, warehousing, and residential usage dating back to the 1800's. The area is close to the Hudson River and piers. Land usage now includes the USS Intrepid Sea, Land and Space Museum visitors' center.

- The EDR report indicates the potential exists for spills and leaks from other sources within the area. The report identified 20 RCRIS small quantity generators and 12 large quantity generators within 0.25 miles of the site. In addition, there are 28 USTs within 0.25 miles and 52 leaking tanks within 0.5 miles of the former gas works. There are three more former MGPs located within one mile of the West 45<sup>th</sup> Street Gas Works.
- Previous sampling conducted by Con Edison in 1997 and Allee, King, Rosen, & Fleming, Inc. in 1998 for a potential property transfer, found the presence of BTEX, SVOCs, TPH and lead in soils and BTEX, SVOCs, metals and TPH in groundwater at Block 1093 Lot 9. The results indicate that soil and groundwater have been impacted at portions of the former gas works.
- The site is located in an area with mixed commercial, industrial, and residential uses. If impacts are present at the site, potential receptors would include workers, nearby residents, and tourists visiting the USS Intrepid Sea, Land, and Space Museum. In addition, a public school is approximately 0.25 miles east of the site. Most of the former site area is covered with pavement or buildings therefore no exposure pathways for subsurface soil are present. Workers conducting excavation or construction activities could encounter residues from past operations. There is no groundwater usage so the groundwater pathway is not complete.
- The Hudson River is within 200 feet of the former gas works and could be impacted if MGP residuals were migrating from the site or if past disposal practices lead to the disposal of MGP related materials in or near the Hudson River.

## 9.2 COMPLETENESS OF RESEARCH

Research undertaken as part of this report included review of in-house documents and photographs provided by Con Edison, as well as materials gathered at the Municipal Archives of the City of New York, the Municipal Reference and Research Center of the City of New York, the New York City Recorder of Deeds office, the New York City Department of Buildings, the New York Public Library, the Library of Congress, the New York State Department of Environmental Conservation, the Environmental Protection Agency, and various web sites that post historical maps and journal articles. EDR compiled the radius search data for the site.

The materials gathered to date provide a general synopsis of activities that occurred on the MGP site, both before its construction, during its operation, and after it was demolished and the property used for other purposes. The information compiled about the pre-MGP use and the post-MGP use is likely adequate for the purpose of this report. Information gaps still remain concerning specific operating procedures at the MGP itself, as well as byproduct production and disposal activities. Because the MGP operated during years when this information was not published by the PSC, and since internal plant records did not survive for this MGP, it is unlikely these data will be recovered. However, second-hand accounts of the MGP and its operations may exist in newspaper or journal articles that have no indices and therefore are unlikely to be found without considerable additional time and effort.

## SECTION 10

### SUMMARY OF HISTORICAL RESEARCH FINDINGS

#### 10.0 PRIORITIZATION SUMMARY AND CONCLUSIONS

The New York Department of Environmental Conservation (NYSDEC) requested Consolidated Edison Company of New York, Inc. (Con Edison) perform historical research at 47 former manufactured gas plant (MGP) related sites located within the greater New York City area. The historical research will support the prioritization of these 47 former MGP and gas holder sites based on potential, actual, and perceived human health exposure risks, environmental impacts, sensitive receptors, current site usage, the surrounding community, potential for development, site control and ownership, and size of the former MGP or gas holder operation. Table 10.1 presents a summary of factors that will be used in the prioritization of the 47 sites.

**Table 10.1 Prioritization Criteria and Factors**

<b>Prioritization Criteria</b>	<b>Prioritization Factors</b>
Does Con Edison own and control access and site usage?	Con Edison does not currently own any of the former Gas Works parcels. Con Edison temporarily occupies the northern half of Tax Lot in Block 1093.
Relative size of the former Gas Works.	The former Gas Works site was approximately 5.4 acres and occupied most of Block 1092 and approximately half of Block 1093.
Potential for development.	Tax Lot 9 in Block 1093 is currently being developed as a bus parking lot and pedestrian bridge providing access to the Intrepid Sea, Air, and Space Museum. Construction was observed during the site reconnaissance visit. The UPS building was built in 1961. The two warehouse buildings were built on Block 1092 in the 1920s. These building are still in use. Their potential for redevelopment is unknown but would be related to real estate values.
Current potential for direct exposure to impacted soils.	The former Gas Works footprint is either paved or has buildings on it. Direct exposure to impacted soils is limited to site workers conducting excavations and other intrusive activities.
Potential for site actions to be triggered by other regulatory means.	The EDR radius search identified 12 RCRIS large quantity generators, 20 RCRIS small quantity generators, 52 leaking storage tank sites, 28 UST sites, 4 chemical bulk storage tanks and 3 former coal gassification plants within 0.5 miles of the former Gas Works. UPS maintains tanks on part of the former Gas Works site and Con Edison operates a natural gas refueling station.

**Table 10.1 Prioritization Criteria and Factors (continued)**

<b>Prioritization Criteria</b>	<b>Prioritization Factors</b>	
Presence and proximity of sensitive receptors.	Groundwater Use Aquifers	None
	Surface Water Bodies	The Hudson River is less than 0.25 miles west of the site.
	Groundwater Seepage Areas.	None
	Population	4,457 people in Census Tract 129. 1,537,195 people in Manhattan Borough.
	Playgrounds/Parks	The nearest playground and park are 0.25 miles east of site and 0.25 miles north of site, respectively.
	Schools	The PS51 Elias Howe School is less than 0.25 miles east of the site.
	Residences	There are residences within 0.25 miles of the site (multifamily apartments and high-rise apartments).
	Gardens	None
	Wetlands	The nearest Federal wetland is 5,000 feet from the site in Central Park. The EDR report shows wetlands around the piers approximately 200 feet west of the site.
Physical Site Factors-	Topography	The site topography is gently sloping to the west. Portions of the site are elevated with radial drainage to the nearest street.
	Soil Types and Permeability	The soils are fill with relatively high permeabilities. The site is covered limiting access and infiltration.
	Cover	The site is paved or covered with buildings.
	Depth to Groundwater	5.5 to 8 feet

**Table 10.1 Prioritization Criteria and Factors (continued)**

<b>Prioritization Criteria</b>	<b>Prioritization Factors</b>	
Physical Site Factors (continued)	Groundwater Use	No known use in vicinity.
	Surface Water Proximity and Use	The Hudson is less than 0.25 miles from the site. There are no known surface water intakes downstream of the site.
Presence of buildings with basements onsite or nearby. Volatilization/seepage exposure pathway to residents or workers.	The two warehouse buildings onsite and neighboring buildings have basements. The potential for seepage/volatilization into basement areas exists if impacted soils are present.	
Ongoing or obvious impacts to surface water.	Slight sheens and wind-blown trash were observed in the Hudson River in the vicinity of the Intrepid Sea, Air, and Space Museum pier. Impacts from the Gas Works and coal tar were not apparent during the site reconnaissance.	
Degree and extent of impacts associated with other (non-MGP) site uses.	Impacts were not observed.	

## SECTION 11

### REFERENCES

Allee King Rosen & Fleming, Inc., *Route 9A Reconstruction Project: Final Environmental Impact Statement*, Prepared for the New York State Department of Transportation and Federal Highway Administration, May 1994.

Assessed Valuation of Real Estate, 1855, On file at the Municipal Archives of the City of New York.

Bromley, George Washington and E. Robinson, 1879, *The Atlas of the Entire City of New York*. Volume 4. Bromley and Robinson Company, Philadelphia.

Brown's Directory, 1889-1899, *Brown's Directory of American Gas Companies, Gas Statistics*.

Collins, Frederick L., 1934, *Consolidated Gas Company of New York, A History*. Consolidated Gas Company, New York.

Colton, J.H., 1836, *City and County of New York*. J.H. Colton and Co., New York.

Consolidated Edison, Various internal records.

Department of Buildings (DOB), New York City, 1960, Bin #1080977.

Downing, R.C., 1934, Developments in Condensing, Scrubbing and Purification of Gas. *American Gas Journal* 140(5): 63-66, 151.

Dripps, Matthew, 1852, *City of New York Extending Northward to Fiftieth Street*. Dripps and Company, New York.

Dripps, Matthew, 1867 *Plan of the City of New York from the Battery to Spuyten Duyvil Creek*. Dripps and Company, New York.

Eng, Robert, 1985, *Survey of Town Gas and By-product Production and Locations in the U.S. (1880-1950)*. Prepared by Radian Corporation for the Environmental Protection Agency, Research Triangle Park, NC.

Engineering-Science, 1993. *Environmental Assessment Report Mendon Leasing Corporation, 527 West 23<sup>rd</sup> Street New York, New York*, Prepared for Greyhound Lines, Inc., September 1993.

Foster-Wheeler Environmental Corporation, 1998. *Phase I Environmental Site Assessment, West 45<sup>th</sup> Street Operations Center, Manhattan, New York*, Prepared for Con Edison Company of New York, Inc., September, 1998.

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PARSONS

Hartgen Archaeological Associates, Inc., 1994, *Route 9A Reconstruction Project, Final Environmental Impact Statement, Appendix C, Cultural Resources*. Prepared by Hartgen Archaeological Associates, Inc. for New York State Department of Transportation and Federal Highway Administration.

n.d., The Gas Industry in the Route 9A Reconstruction Corridor of Manhattan. Undated report on file at Con Edison.

NYSDEC, 2001. 6 NYCRR Part 864, Reclassification of Fresh Surface Waters Lower Hudson River and Upper East River-Long Island Sound Drainage Basins, October 11, 2001.

*New York Times*, 1880, Explosion and Loss of Life. What Followed a Series of Blasts on the West Side. *New York Times*. June 18, 1880, p. 8, col. 4.

Nisbet-Latta, M., 1907, *Hand-Book of American Gas-Engineering Practice*. D. Van Nostrand Company, New York.

Perris and Browne, 1871, *Insurance maps of the City of New York*. Perris and Browne, New York.

Perris and Browne, 1880, *Insurance maps of the City of New York*. Perris and Browne, New York.

Public Service Commission (PSC), 1907-1913 *Report of the Public Service Commission for the First District of the State of New York*. Public Service Commission, New York, NY.

Sanborn Map Company, 1890, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.

Sanborn Map Company, 1899, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.

Sanborn Map Company, 1911, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.

Sanborn Map Company, 1930, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.

Sanborn Map Company, 1950, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.

Sanborn Map Company, 1968, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.

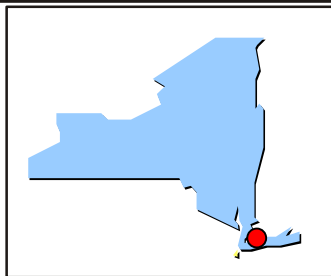
Sanborn Map Company, 1979, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.



- Sanborn Map Company, 1980, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1982, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1984, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1985, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1987, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1988, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1990, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1991, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1992, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1993, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1994, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1995, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Sanborn Map Company, 1996, *Insurance Maps of the City of New York*. Sanborn Map Company, New York.
- Stewart, E.G., 1958, *Town Gas, Its Manufacture and Distribution*. Her Majesty's Stationery Office, London.
- Taylor, Will, 1879, *The City of New York*. Galt and Hoy, New York. On file at the Library of Congress American Memory website <http://memory.loc.gov/>.
- Viele, Egbert L., 1865, *Sanitary and Topographical Map of the City and Island of New York*. Mayer and Company, New York.

Wolfe, John H., 1934, Three Quarters of a Century of American Water Gas Progress. *American Gas Journal* 140(5):45-49, 147.

# FIGURES



New York Quadrangle

LATITUDE: N40° 45' 46"  
 LONGITUDE: W73° 59' 56"



0.200 MI

Figure 1

CONSOLIDATED EDISON  
 NEW YORK, NEW YORK

**SITE LOCATION MAP**  
 FORMER WEST 45<sup>TH</sup> STREET GAS WORKS

**PARSONS**

DESIGN \* RESEARCH \* PLANNING

290 Elwood Davis Road, Suite 312, Liverpool, New York 13088 \* (315) 451-9560  
 Offices in Principal Cities



CITY - 30 PIER  
(FORMER PIER 69)

HUDSON RIVER

CITY - 21 PIER  
(FORMER PIER 68)

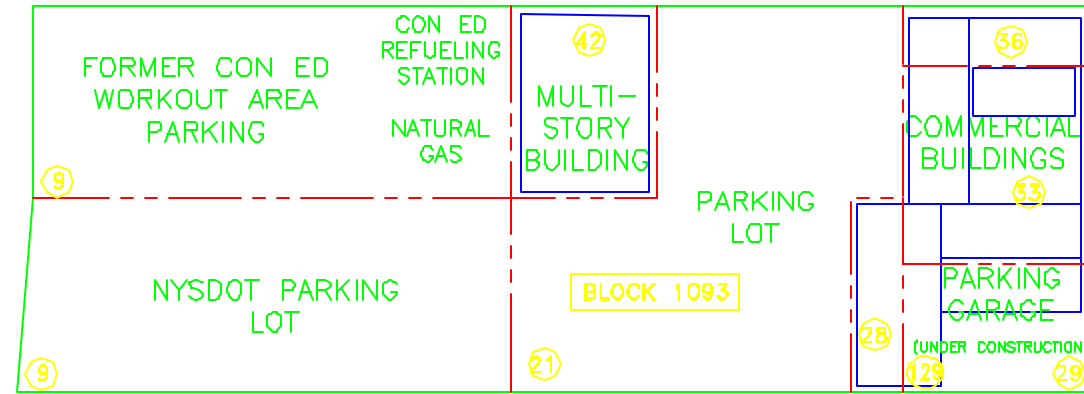
MARGINAL STREET

BLOCK 1107

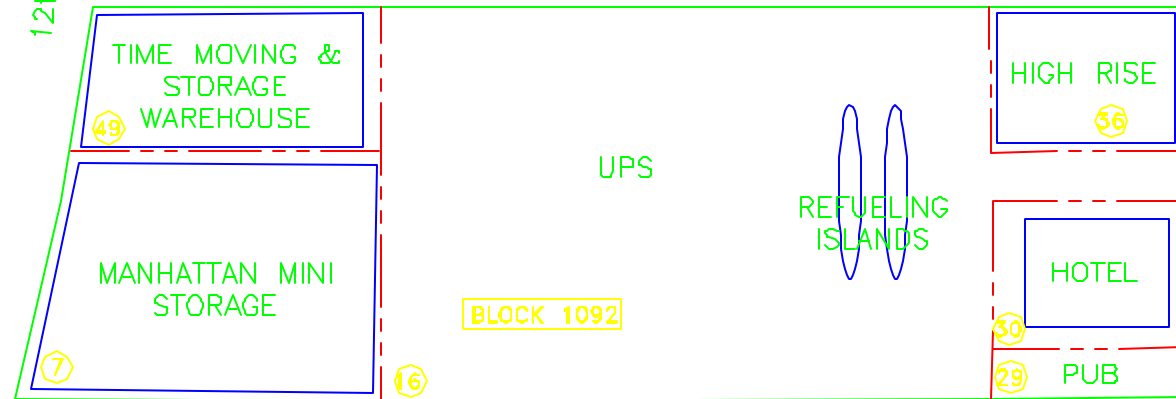
JOE DIMAGGIO HIGHWAY / STATE HIGHWAY 9A

12th AVE

W 46 ST



W 45 ST



W 44 ST

11th AVE

LEGEND

BLOCK 1093

TAX BLOCK NUMBER

21

TAX LOT NUMBER FOR  
PARCELS WITHIN FORMER  
MGP



TAX LOT BOUNDARIES



SCALE: 1"=100'

FIGURE 2

CONSOLIDATED EDISON  
NEW YORK, NY

SITE MAP

FORMER WEST 45th STREET GAS WORKS

**PARSONS**

290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315-451-9560

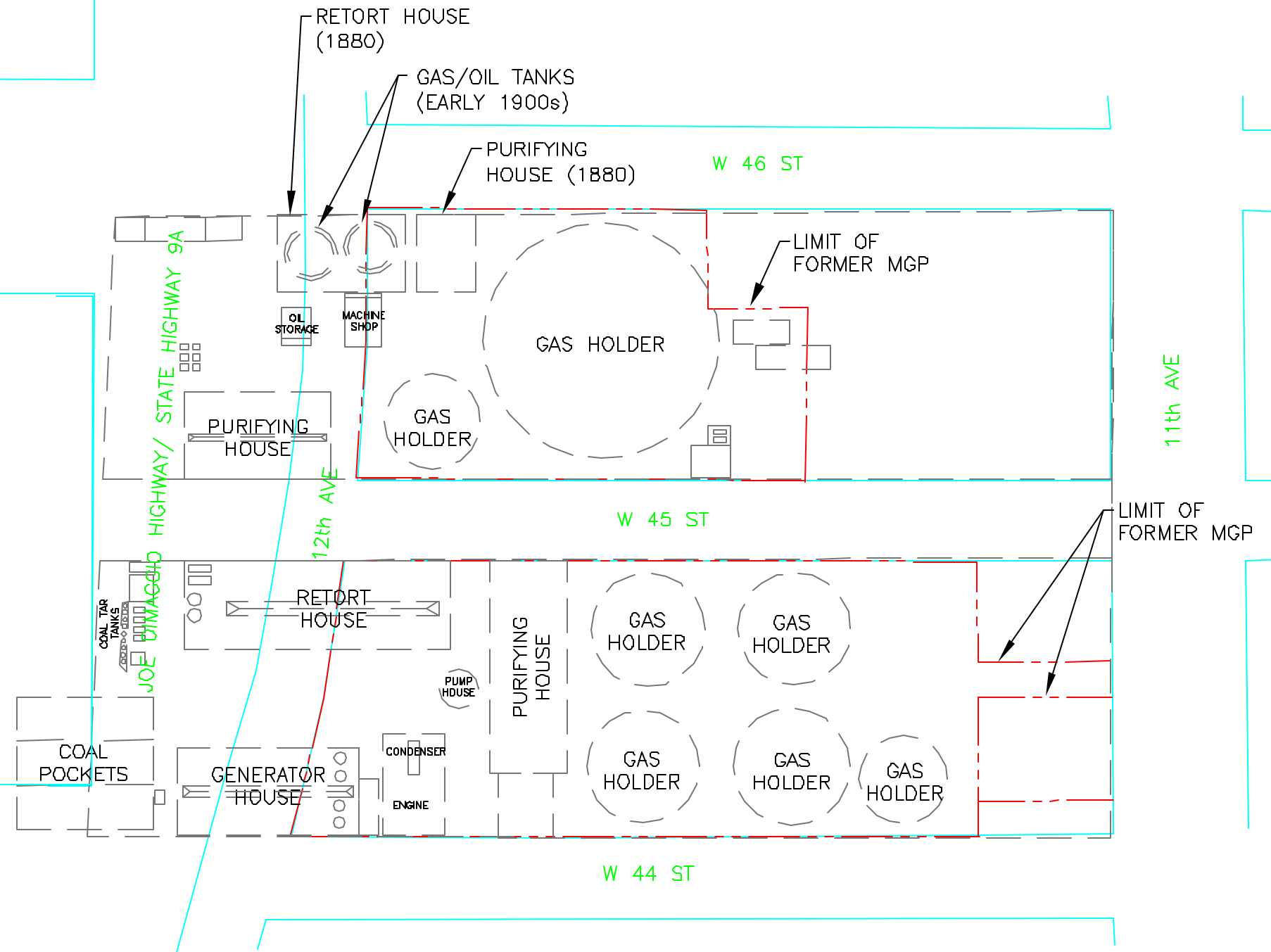


CITY - 30 PIER  
(FORMER PIER 69)

HUDSON RIVER

CITY - 21 PIER  
(FORMER PIER 68)

MARGINAL STREET



LEGEND

- CURRENT FEATURES
- - - - HISTORICAL FEATURES

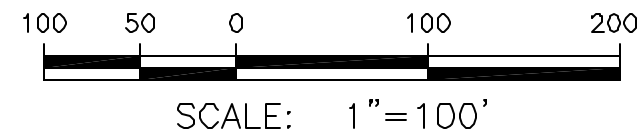


FIGURE 3

CONSOLIDATED EDISON  
NEW YORK, NY

SITE MAP WITH FORMER STRUCTURES  
FORMER WEST 45th STREET GAS WORKS

**PARSONS**

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FIGURE 4 1836 COLTON MAP

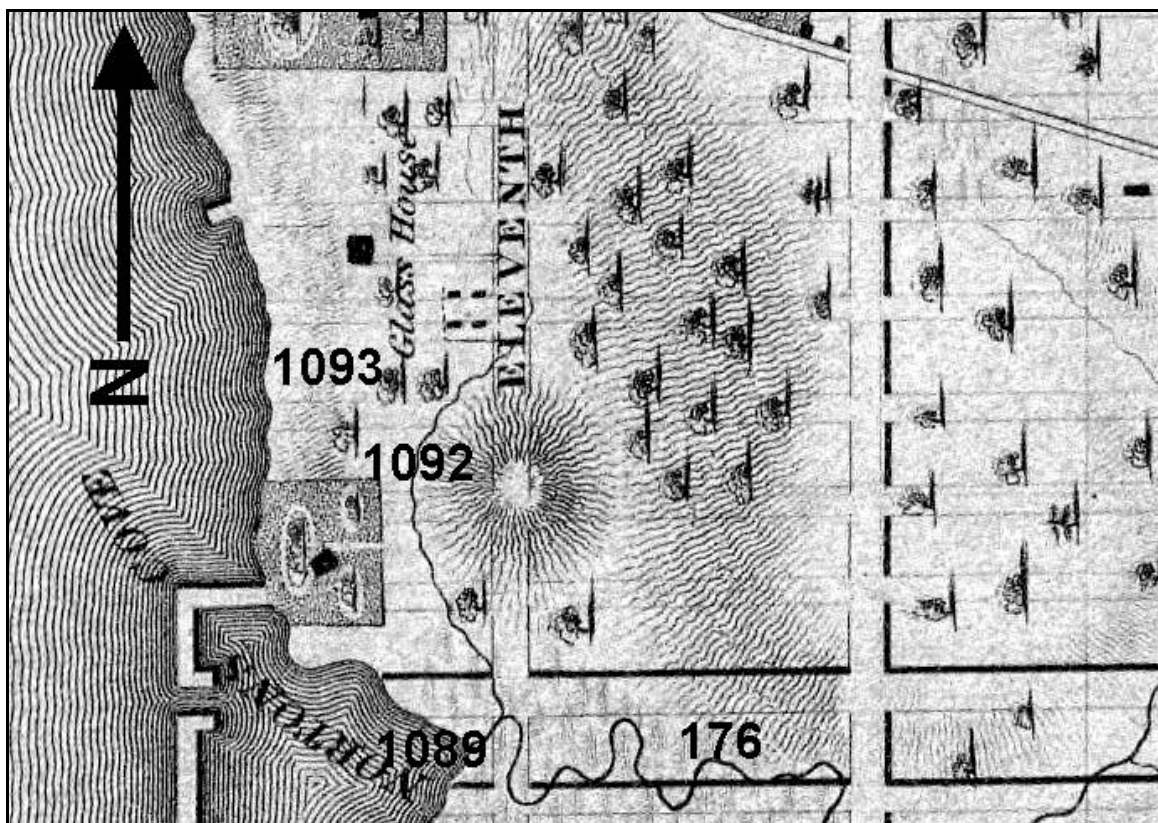


FIGURE 5 1865 VIELE MAP

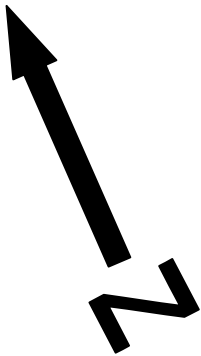
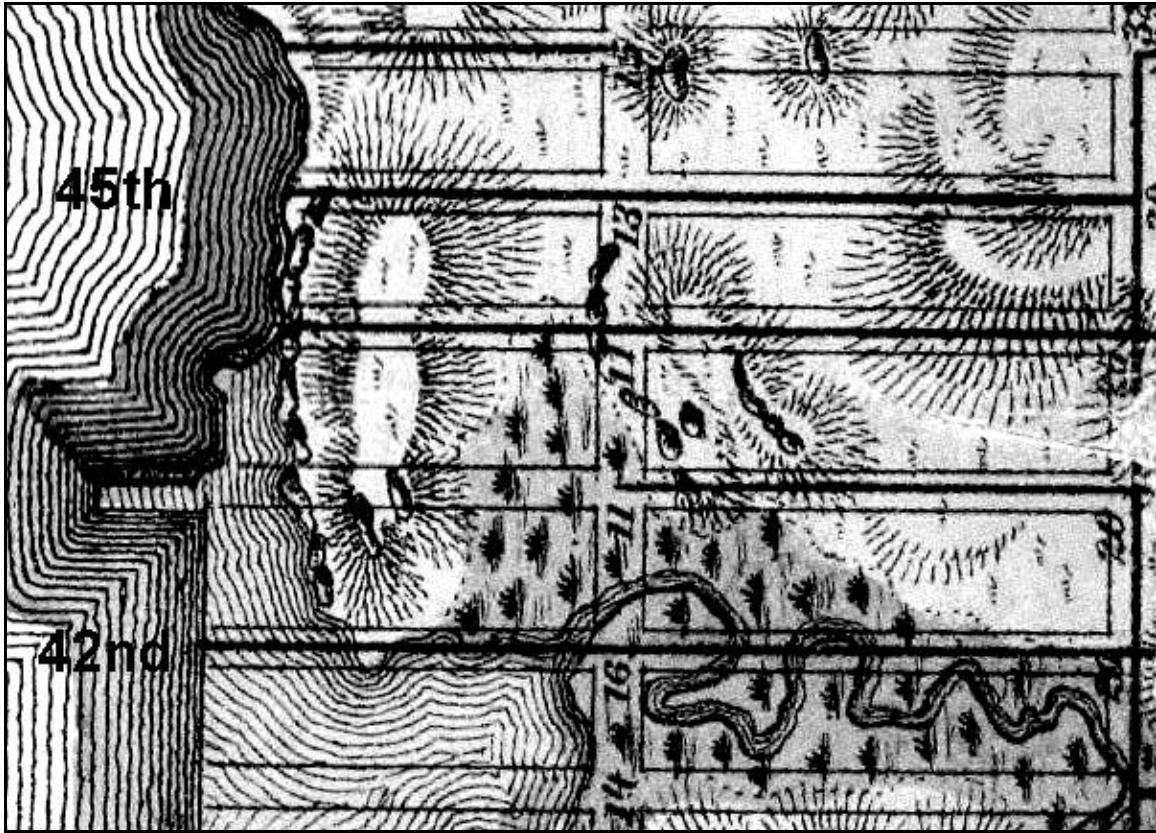




FIGURE 6 1852 DRIPPS MAP

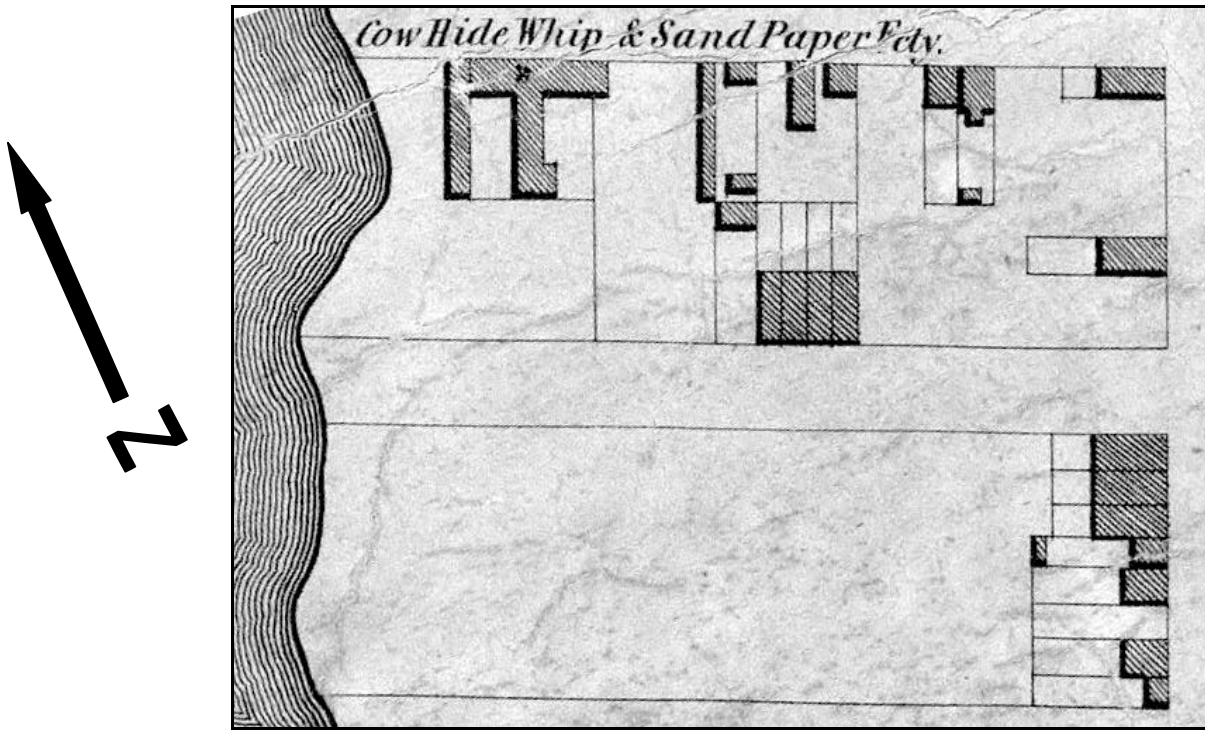


FIGURE 7 1867 DRIPPS MAP

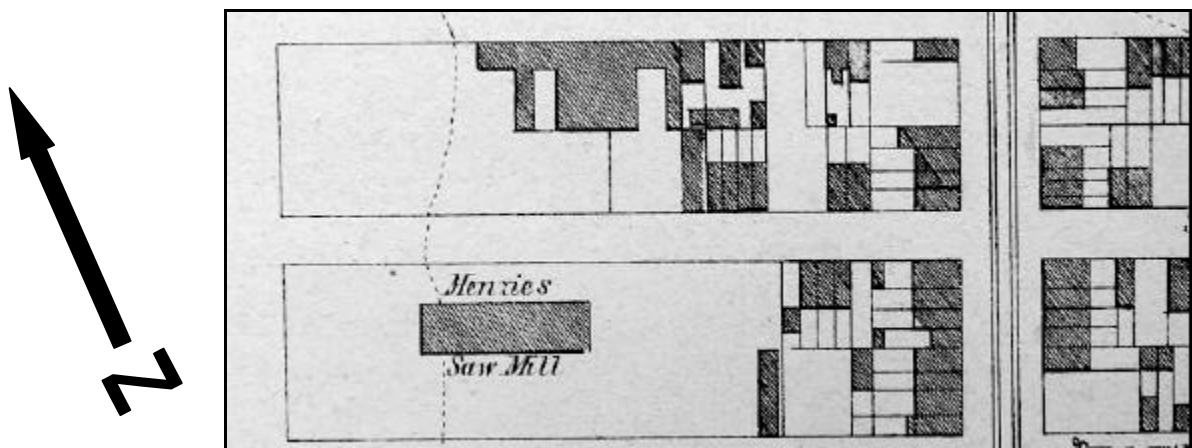


FIGURE 8 1871 PERRIS AND BROWNE MAP

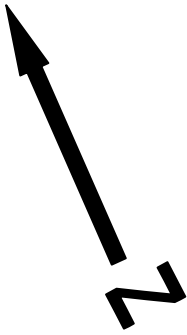
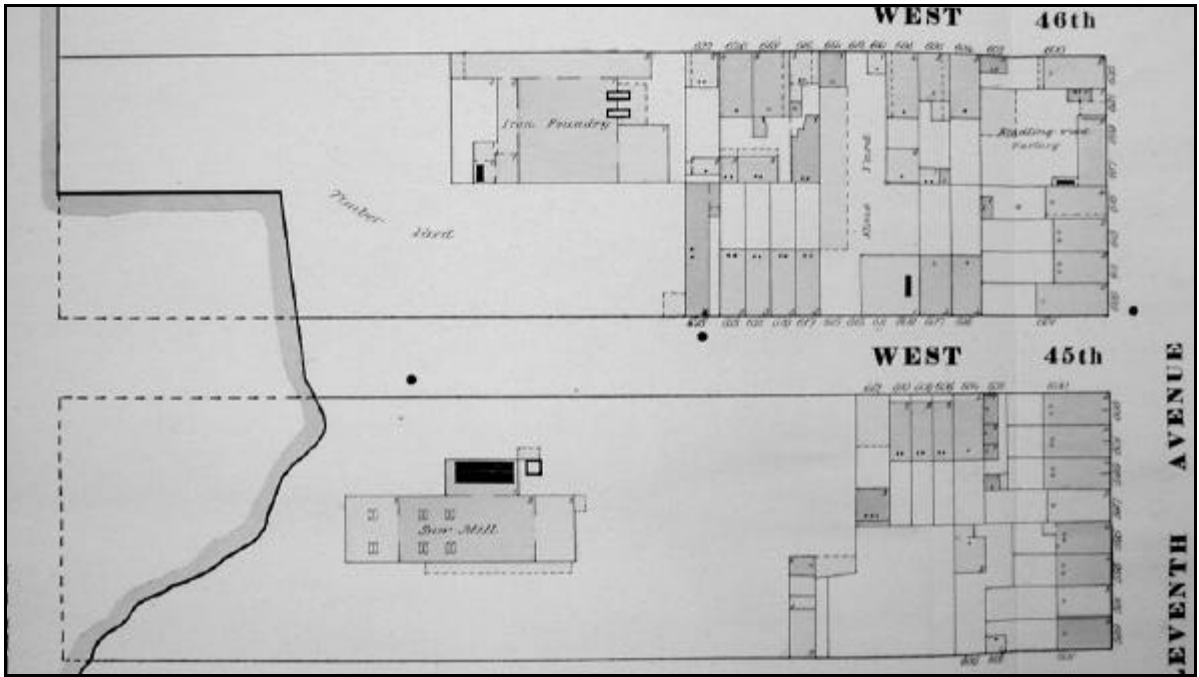


FIGURE 9 1879 BROMLEY MAP

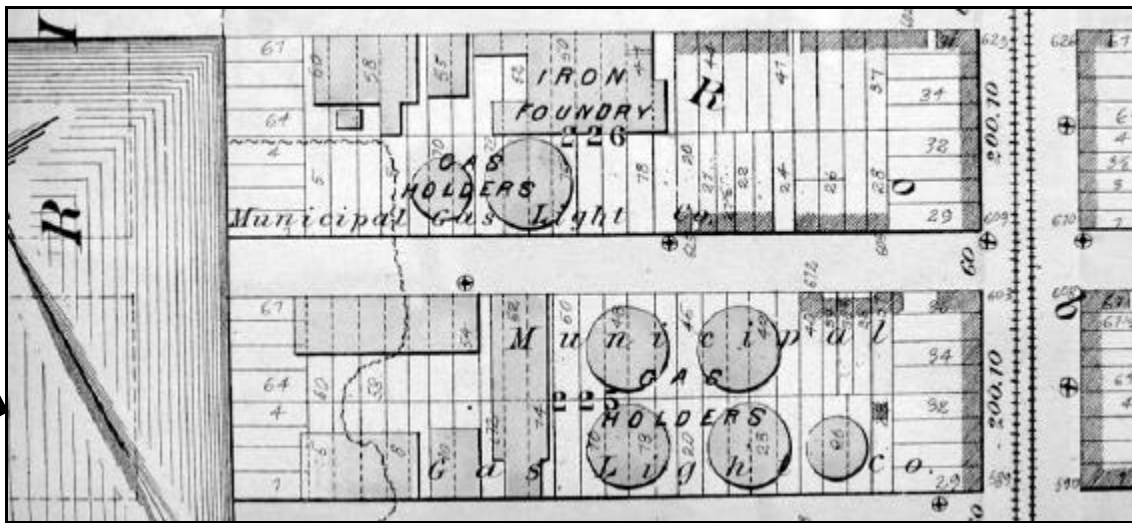


FIGURE 10 1879 TAYLOR BIRD'S EYE VIEW DRAWING

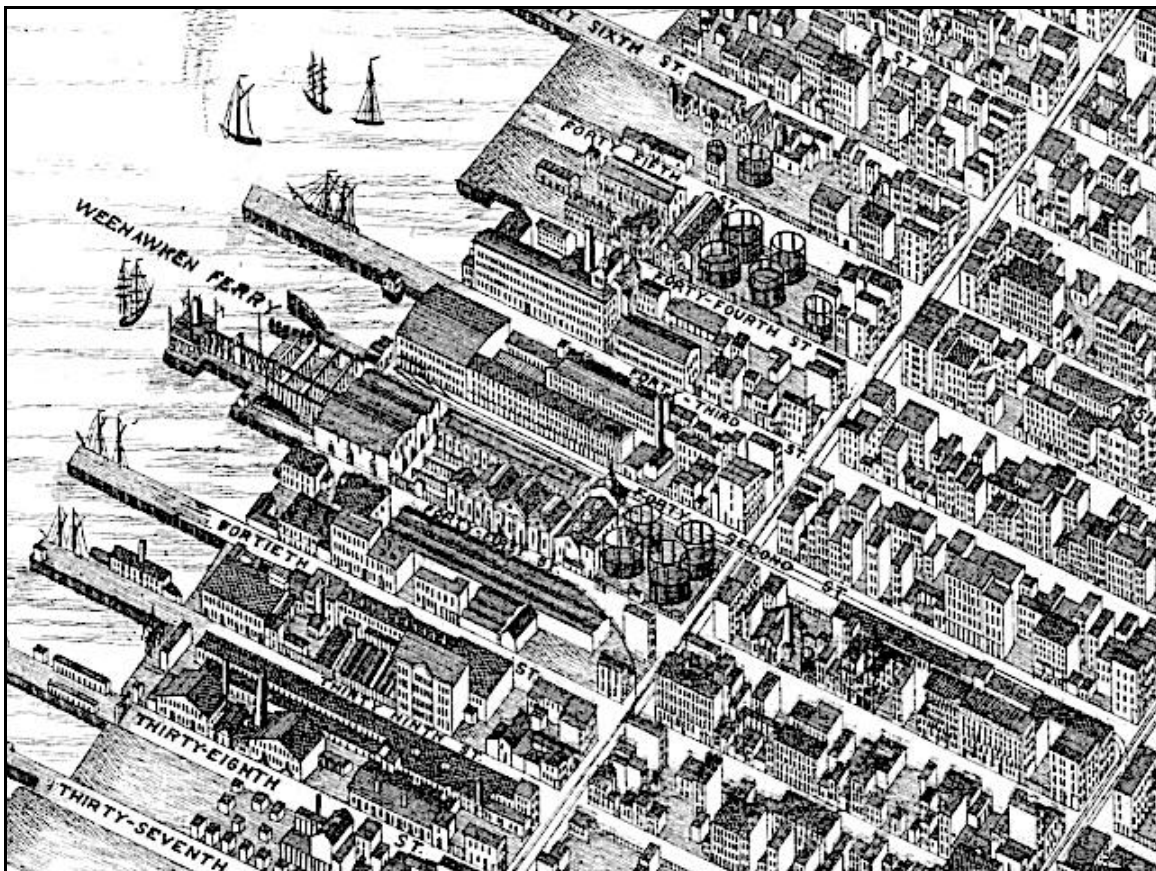
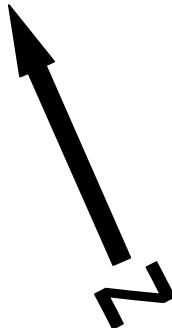
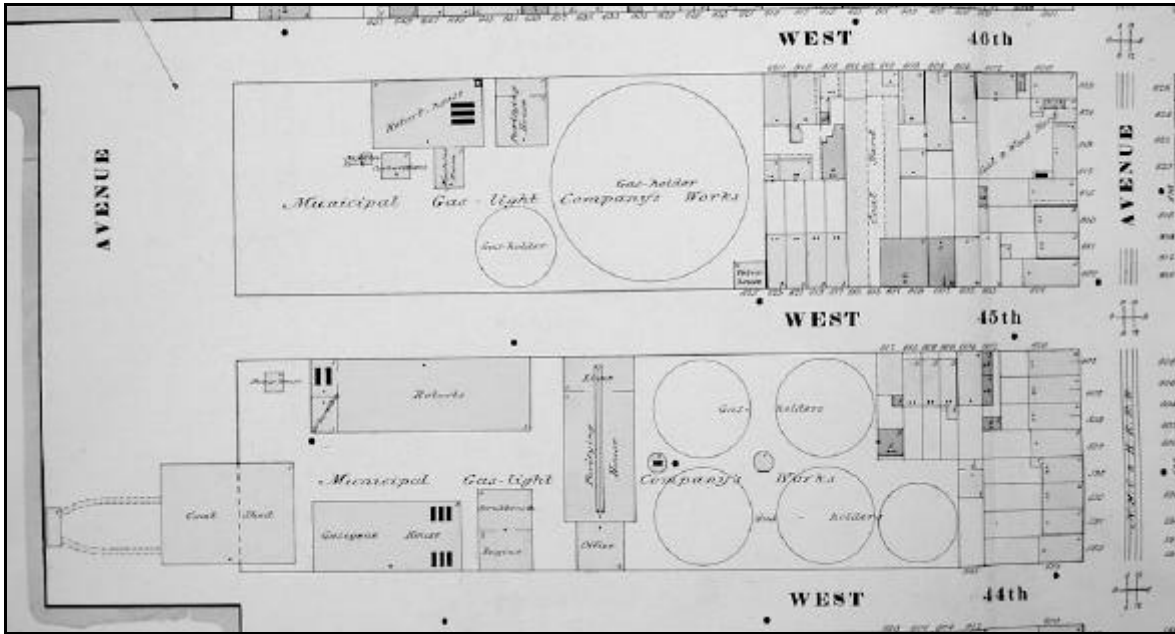


FIGURE 11 1880 PERRIS AND BROWNE MAP

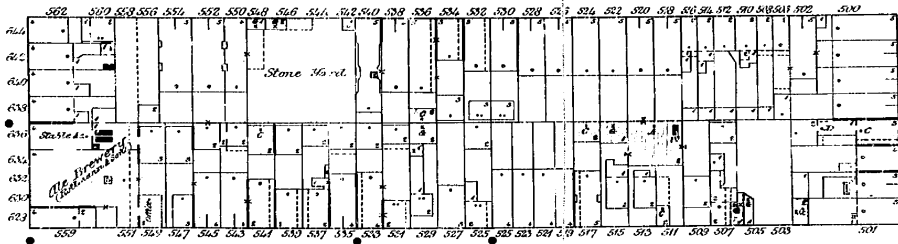


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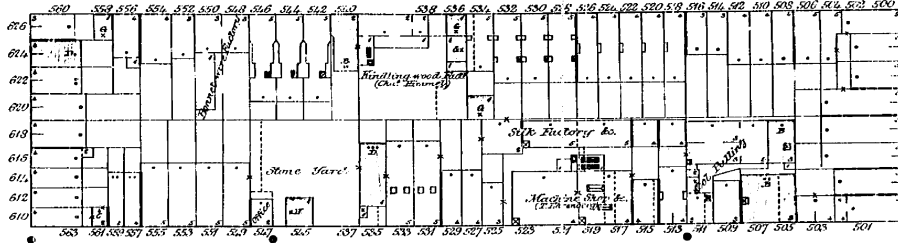
47th

STREET



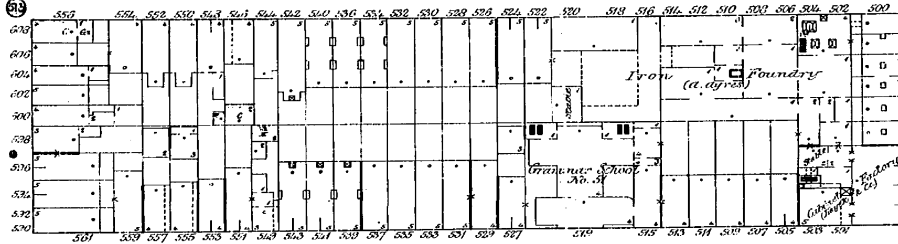
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STREET



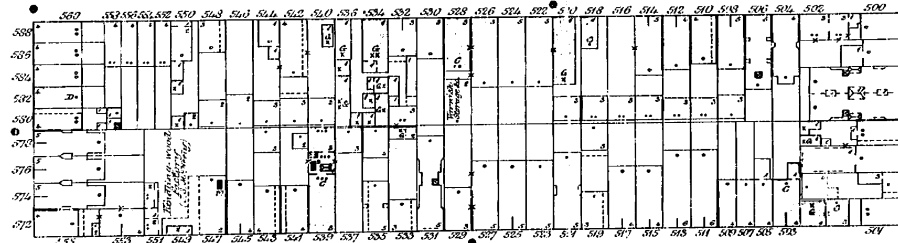
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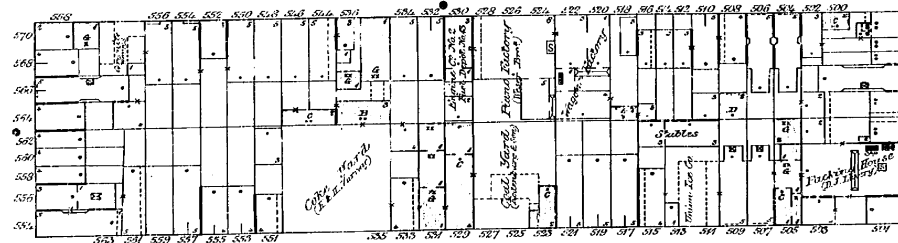
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STREET



43rd

STREET



42nd

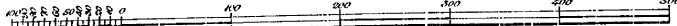
STREET



100 ft.

96

Scale of Feet



Metric Dimensions Scale



100 ft.

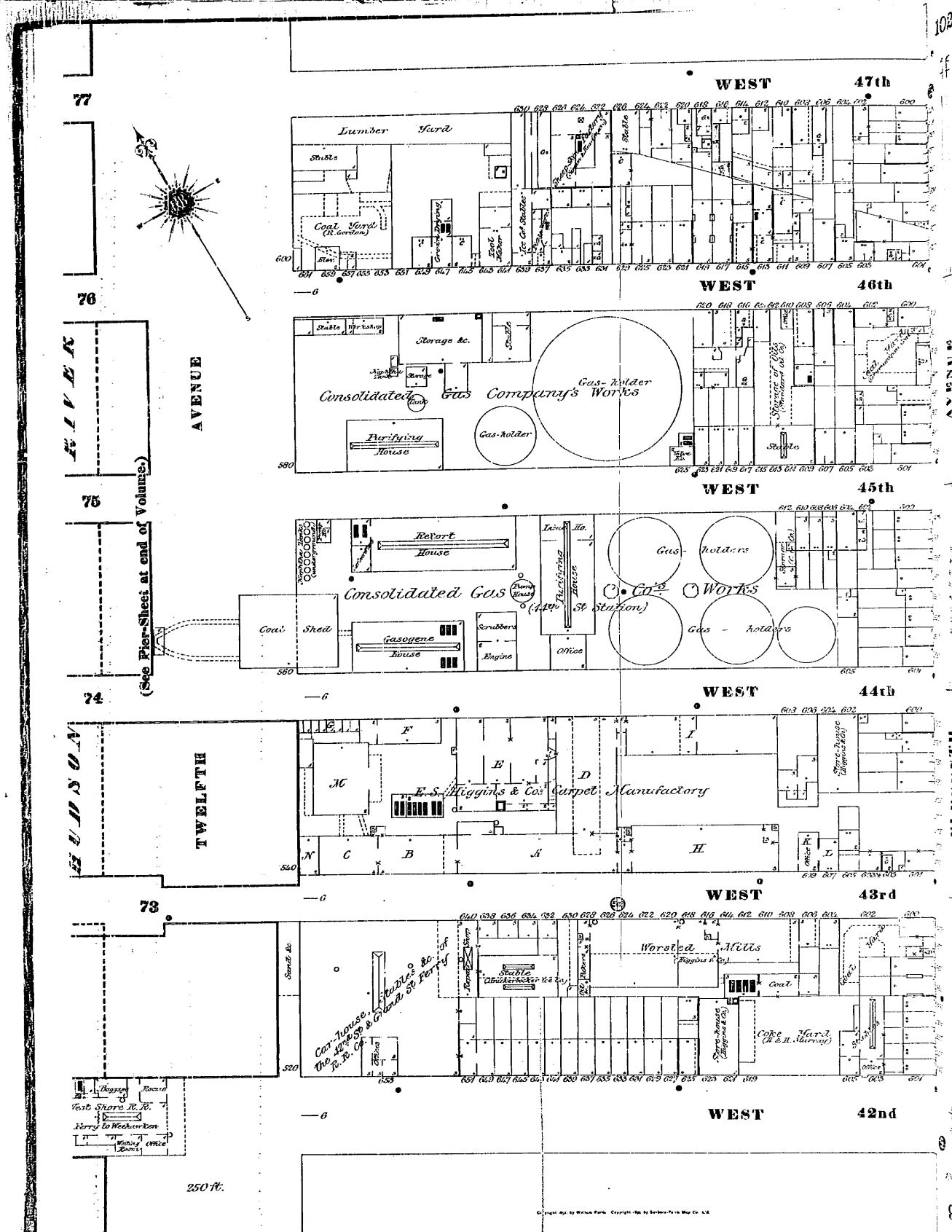
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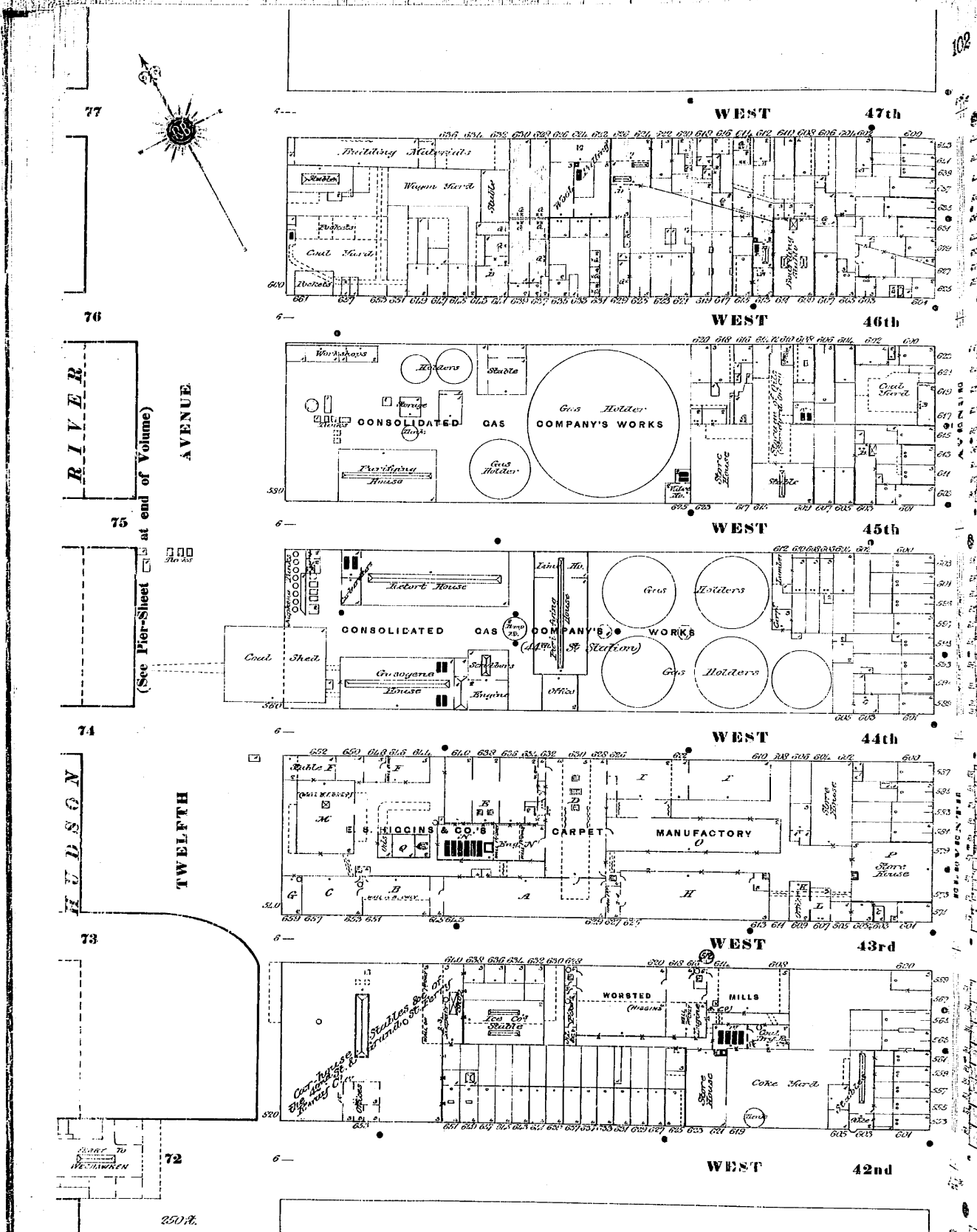
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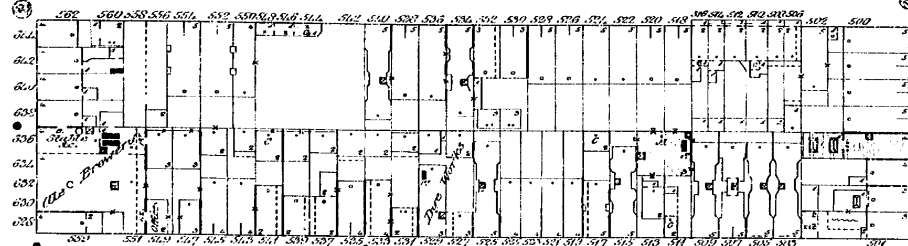
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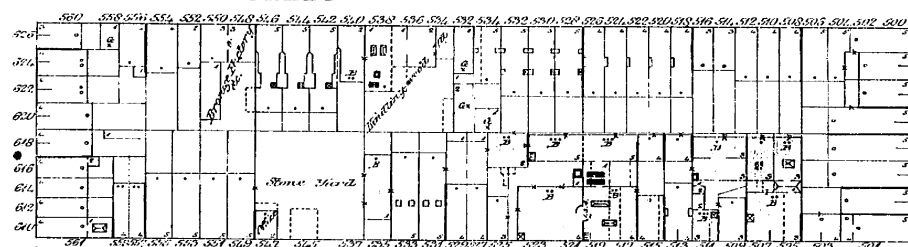
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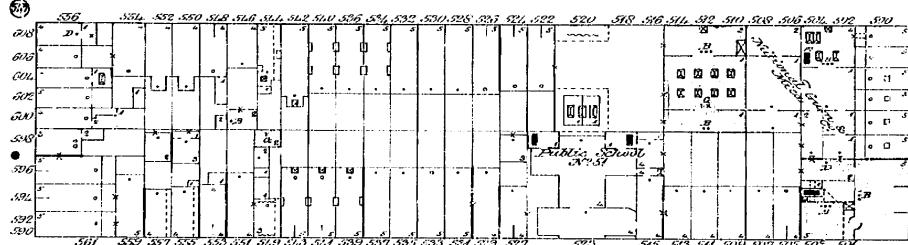
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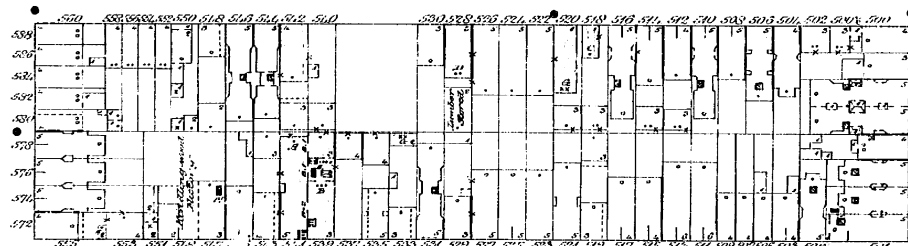
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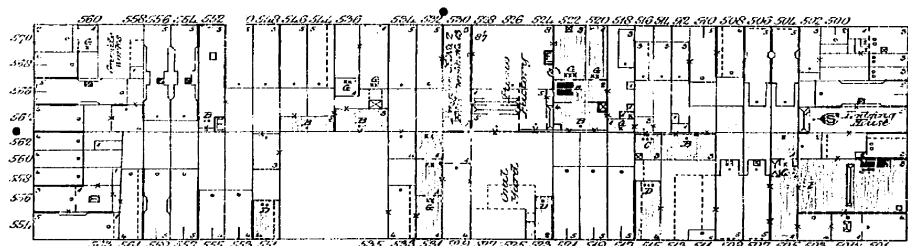
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STREET



STREET



STREET



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AVENUE

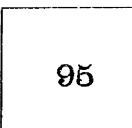
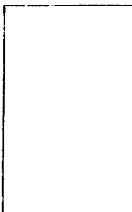
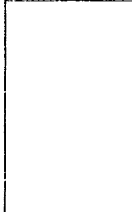
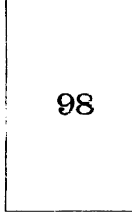
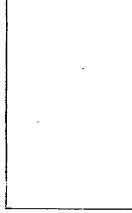
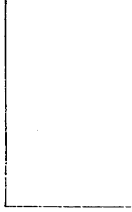
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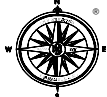
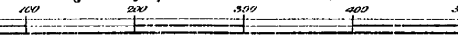
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Scale of Feet



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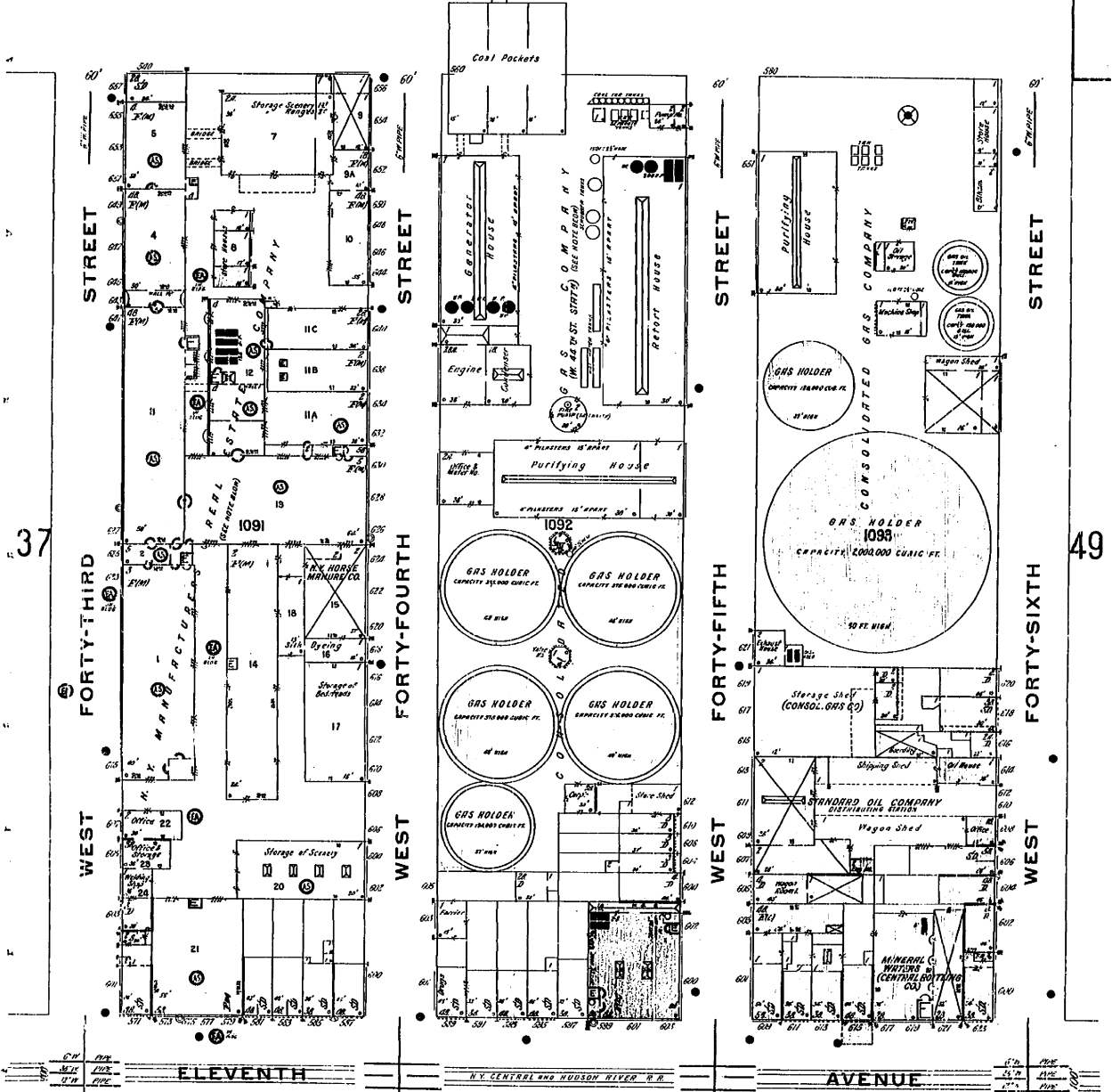
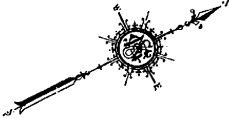
HUDSON 65

66

RIVER 38

TWELFTH

AVENUE



**NY MANUFACTURERS REAL ESTATE COMPANY**  
 THIS SHOWS OWNERS FROM 1898 TO 1900. ELECTRIC FROM 1890 TO 1900. FIRE INSURANCE FROM 1890 TO 1900. WATER SYSTEM - FIRE EXTINGUISHERS AND FIRE CONNECTIONS - TELEPHONE LINES - CEMENT WORKS IN HUDSON WITH 25 FEET PAVING PLAN. IF SPECIAL FIRE LINES AND OTHER LINES IN THIS DISTRICT SEE THE INDEX TO THE MAP.



**CONSOLIDATED GAS CO. WARD ST. STATION**  
 GAS EXHAUSTORS AND PAIR DISTRIBUTOR - TWO USE AND TWO NOT IN USE - IN STOCK - WARD METALS EXHAUSTOR - KANSAS PATENT - FAVORITE FIRE BELL - USE WITH CARTRIDGE WITH BRISTLE TUBE



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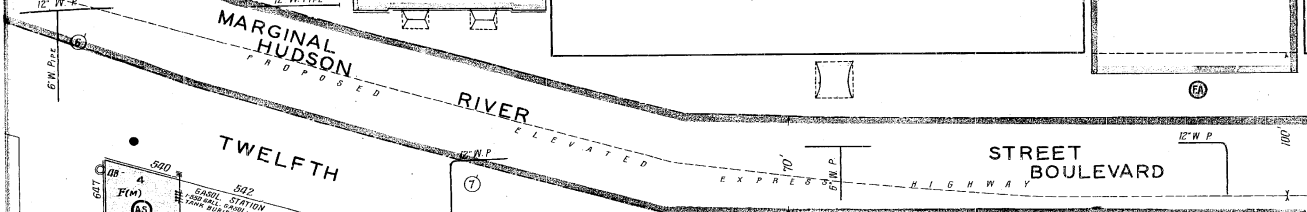
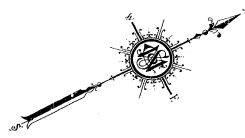
HUDSON

RIVER

38

68

69



TWELFTH

STREET BOULEVARD

STREET

AVENUE

37

STREET

STREET

STREET

49

WEST FORTY - THIRD

WEST FORTY-FOURTH

WEST FORTY-FIFTH

WEST FORTY SIXTH

6\"/>

36\"/>

12\"/>

ELEVENTH

12\"/>

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36\"/>

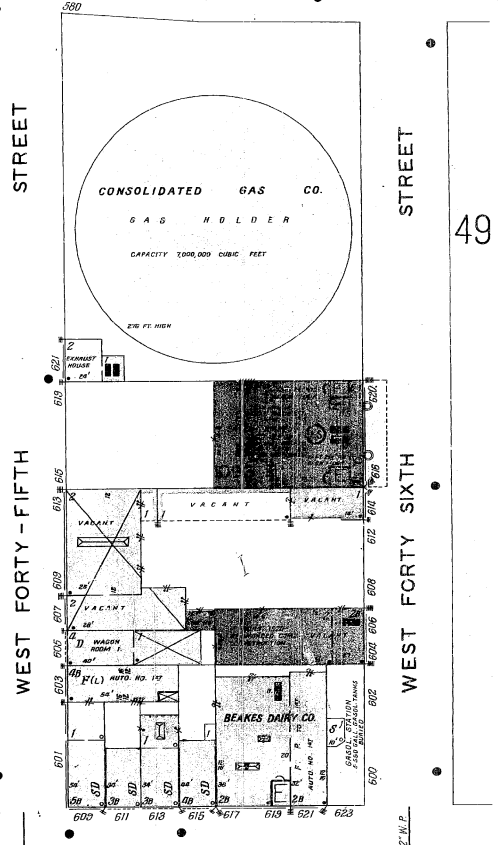
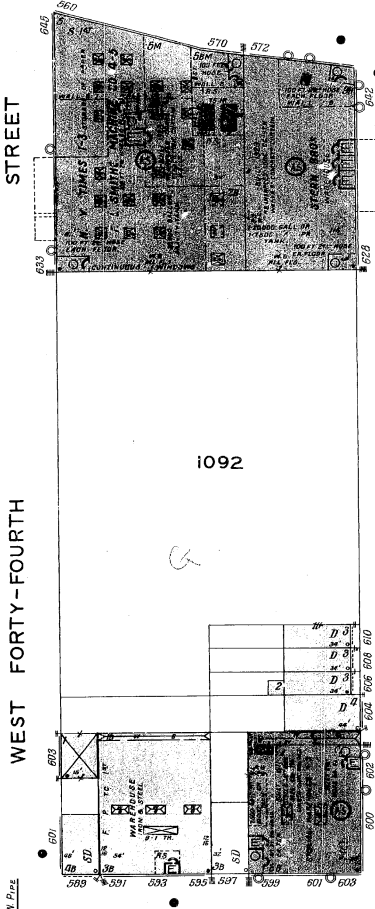
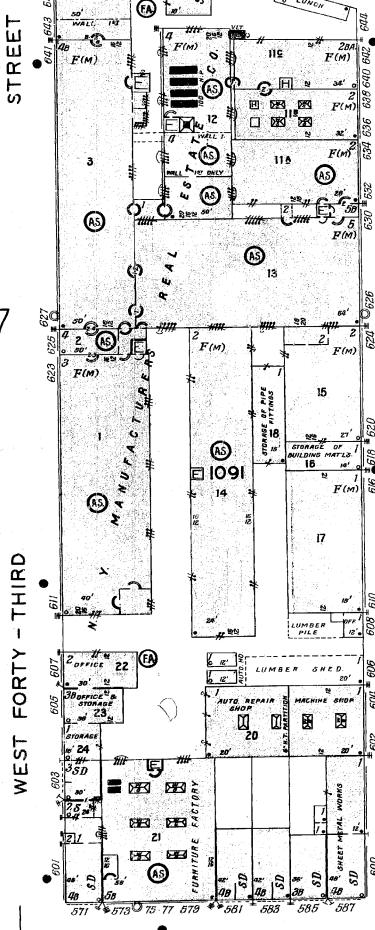
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AVENUE

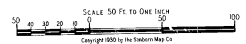
12\"/>

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40



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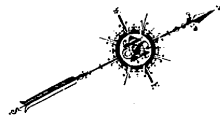
HUDSON

NY 084  
RIVER

N.Y. CIV. VOL. 5  
38

68

69



MARGINAL MILLER

TWELFTH

STREET HIGHWAY

(HUDSON RIVER BLVD)

AVENUE

STREET

STREET

STREET

STREET

37

WEST FORTY-THIRD

WEST FORTY-FOURTH

WEST FORTY-FIFTH

WEST FORTY-SIXTH

49

CONSOLIDATED GAS CO.  
GAS HOLDER  
CAPACITY UNKNOWN LONG PIPE

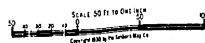
1092

TAXI SERVICE

ELEVENTH

AVENUE

40



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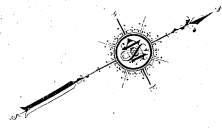
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HUDSON

RIVER

68

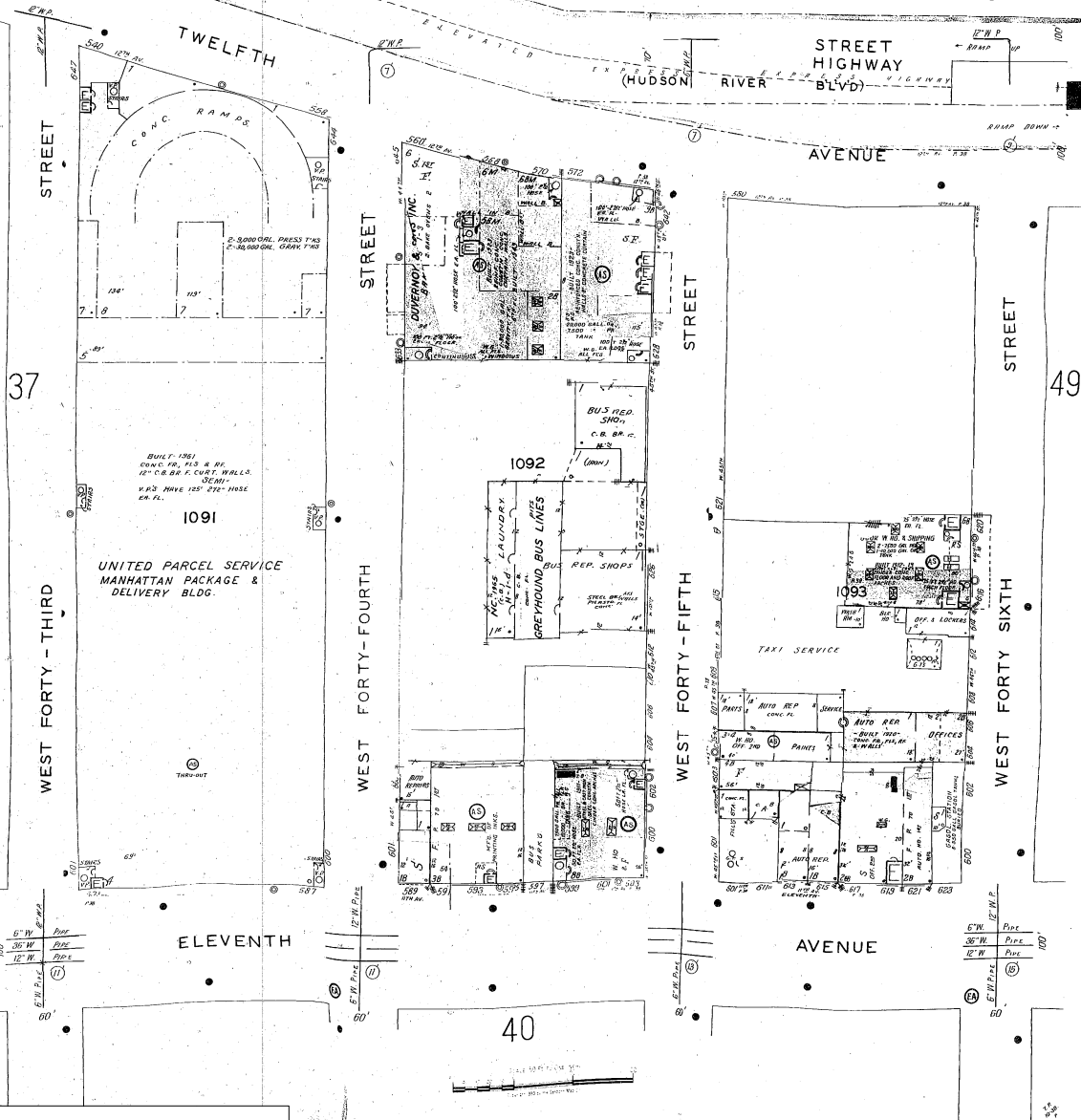
69



MARGINAL MILLER

TWELFTH

STREET HIGHWAY  
(HUDSON RIVER BLVD)  
AVENUE



37

49

WEST FORTY-THIRD

WEST FORTY-FOURTH

WEST FORTY-FIFTH

WEST FORTY-SIXTH

ELEVENTH

AVENUE

40

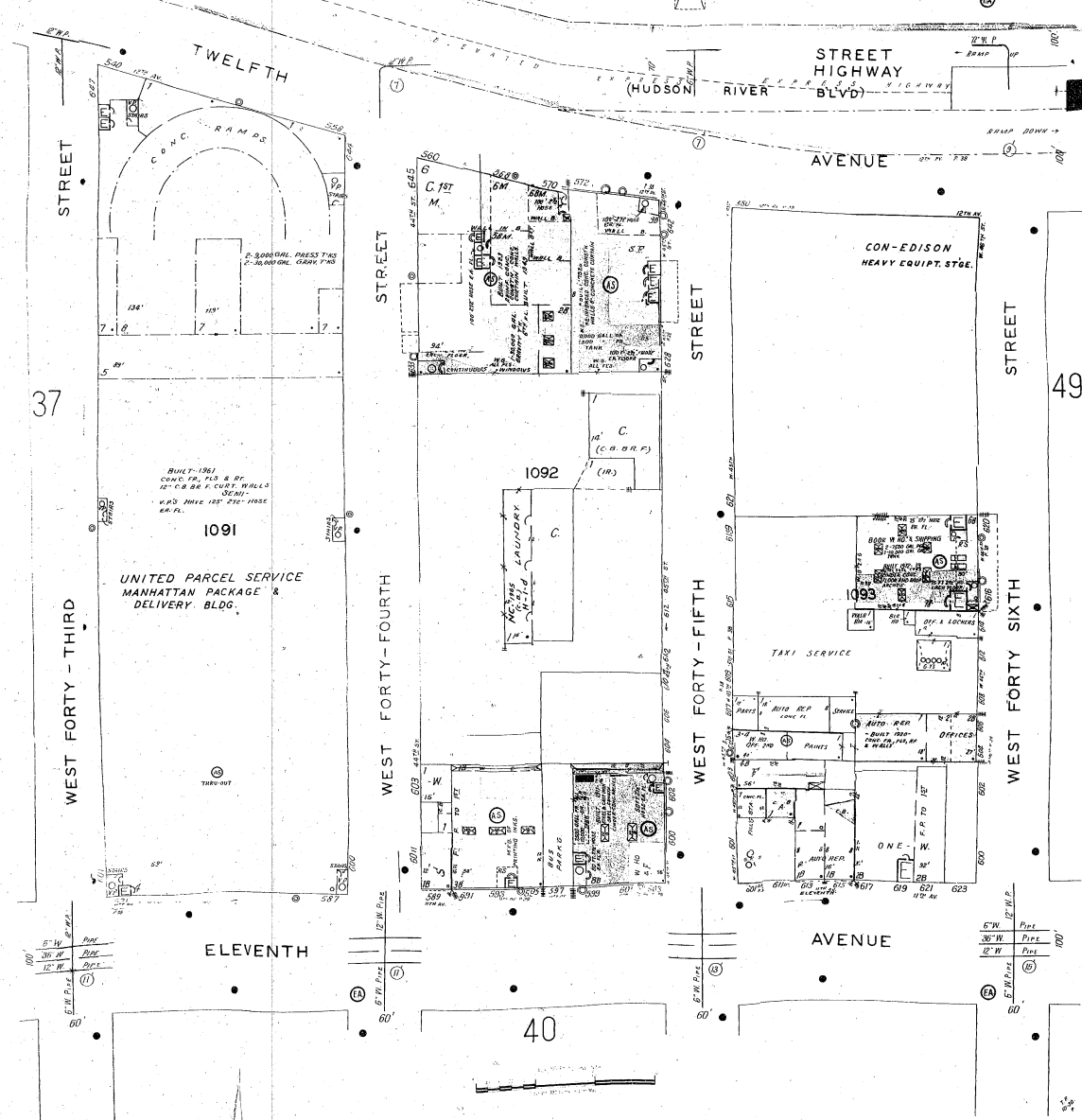
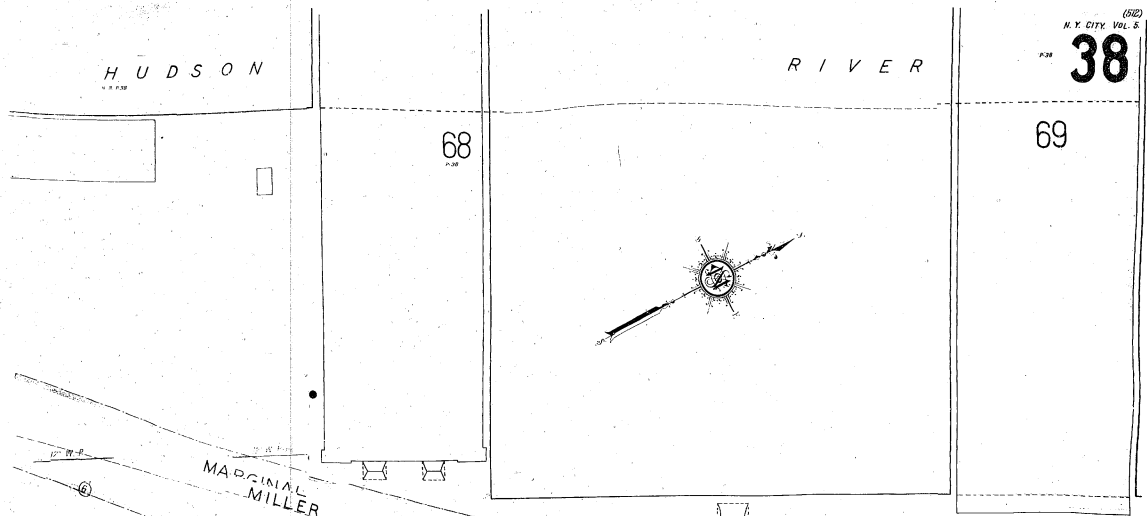


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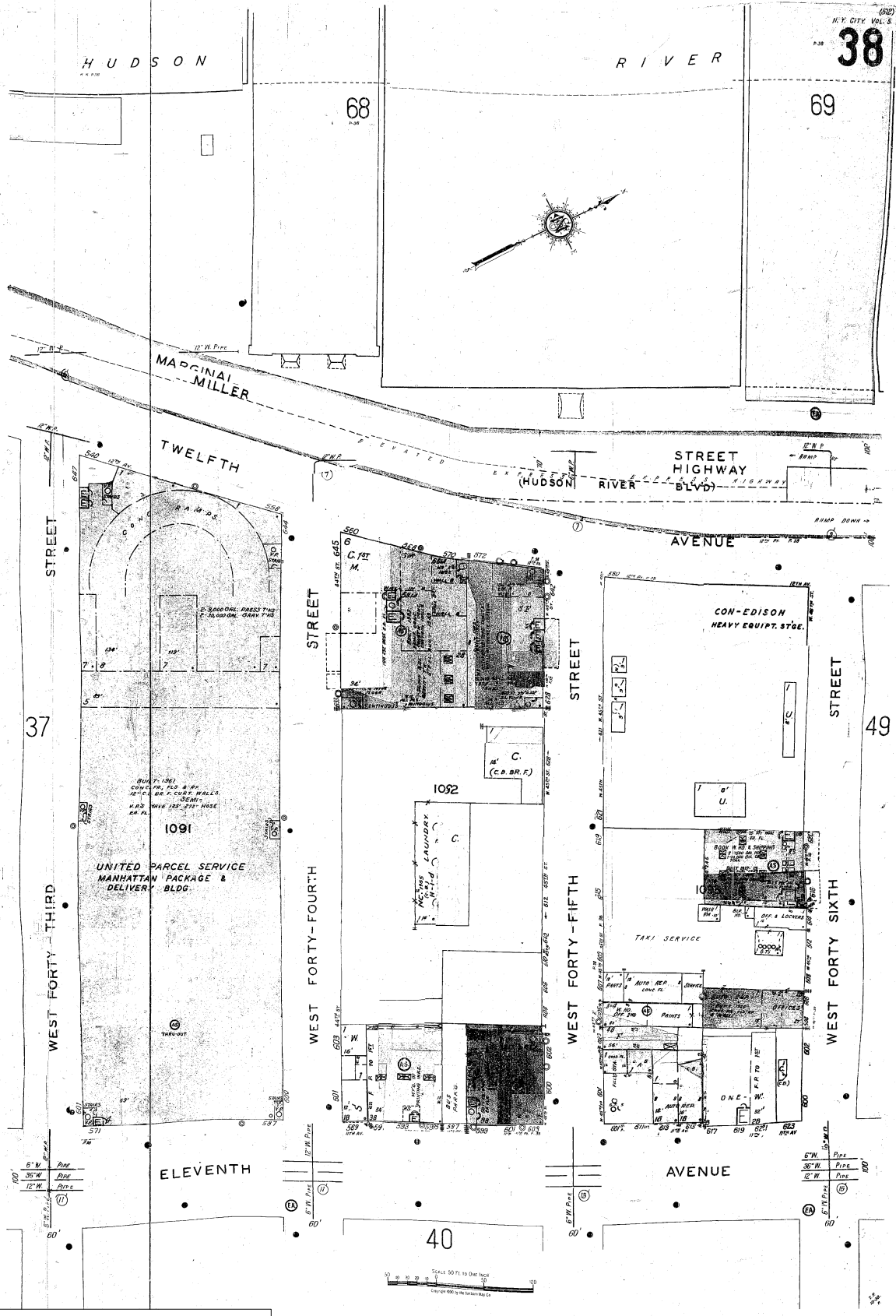


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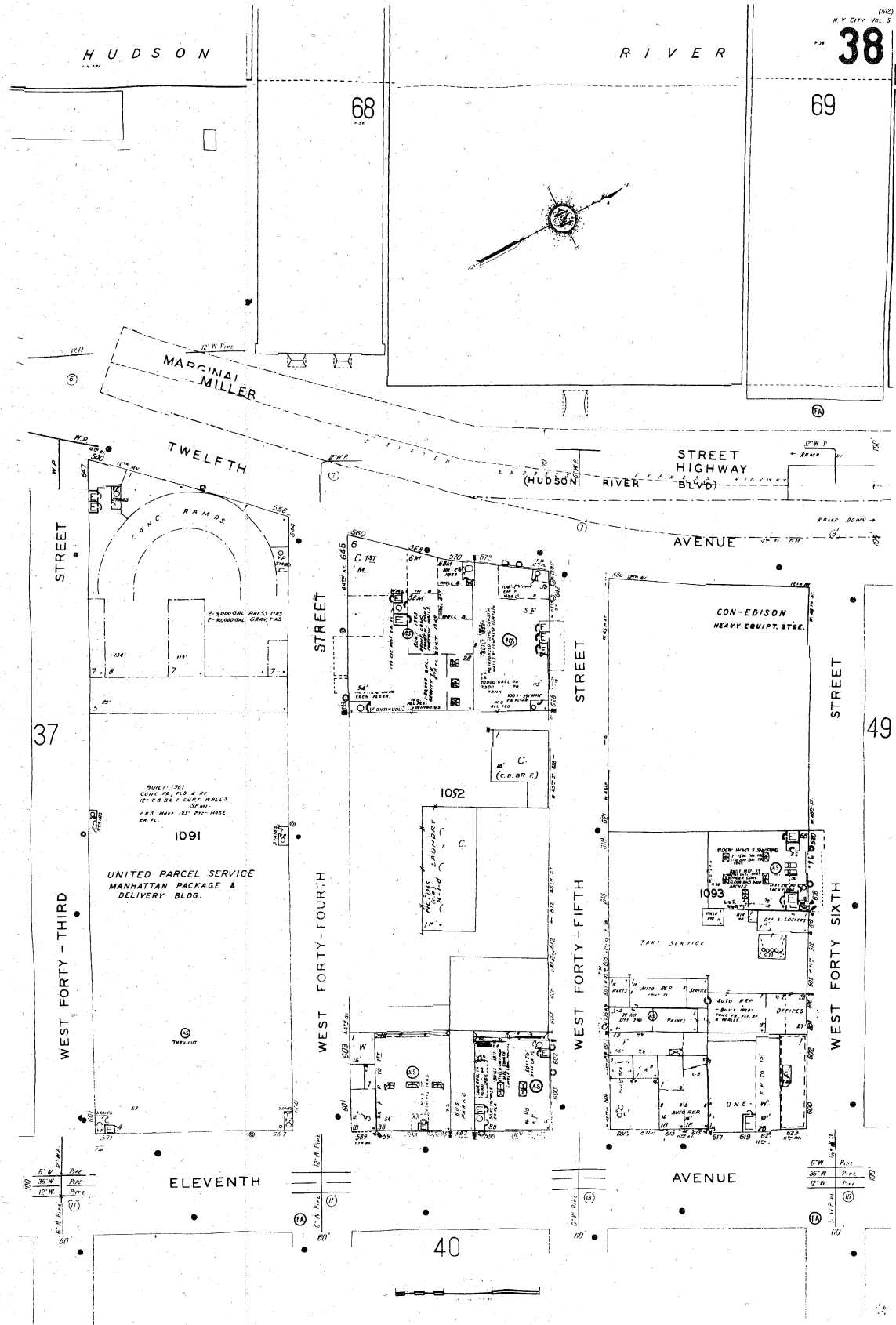


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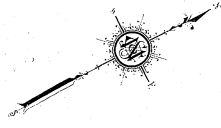
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HUDSON

RIVER

68

69



MARCIAL MILLER

TWELFTH

STREET HIGHWAY  
(HUDSON RIVER BRIDGE HIGHWAY)  
BLVD

AVENUE

STREET

37

STREET

STREET

STREET

49

UNITED PARCEL SERVICE  
MANHATTAN PACKAGE &  
DELIVERY BLDG.

1091

1092

TAXI SERVICE

1093

WEST FORTY SIXTH

ELEVENTH

AVENUE

40



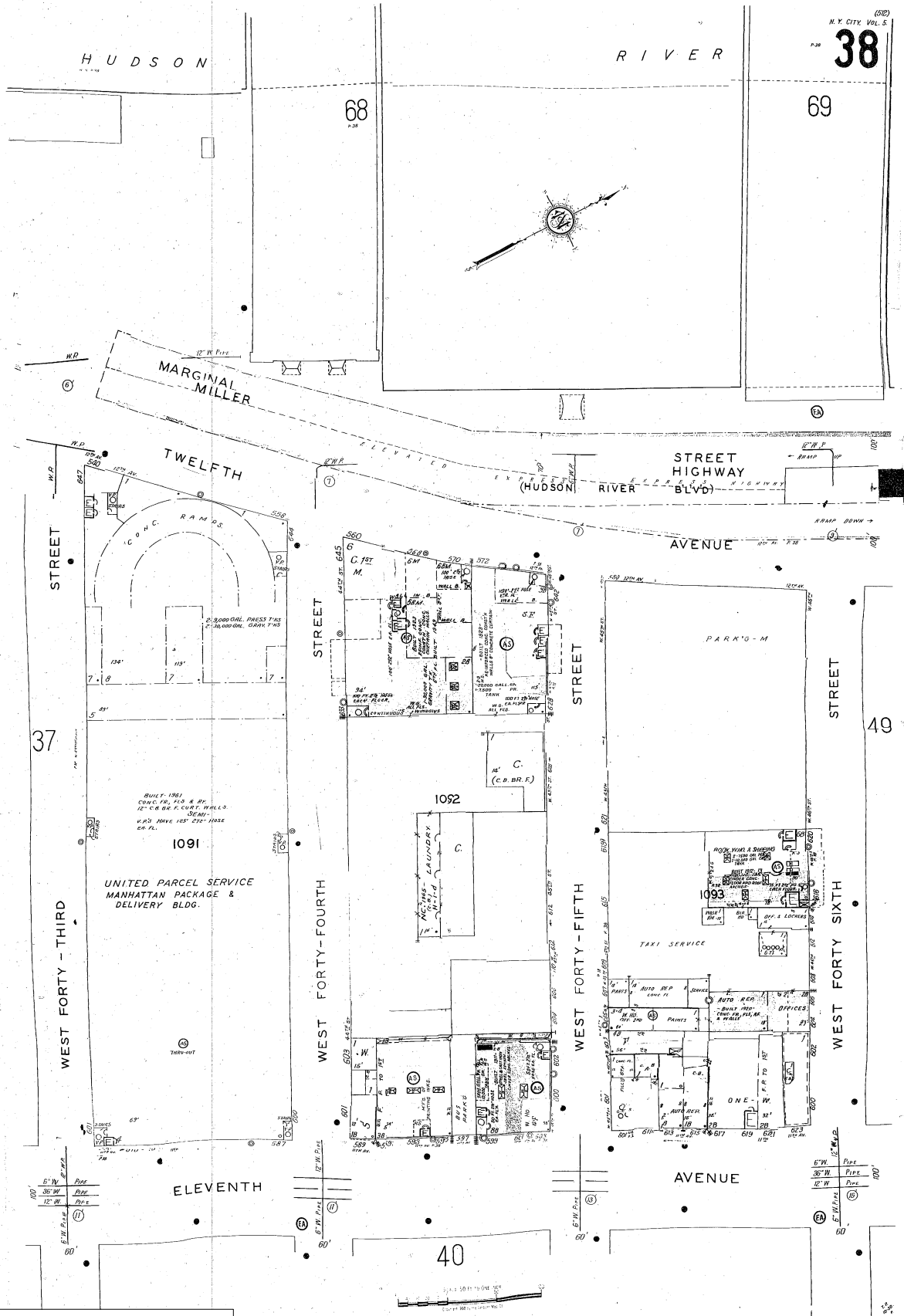
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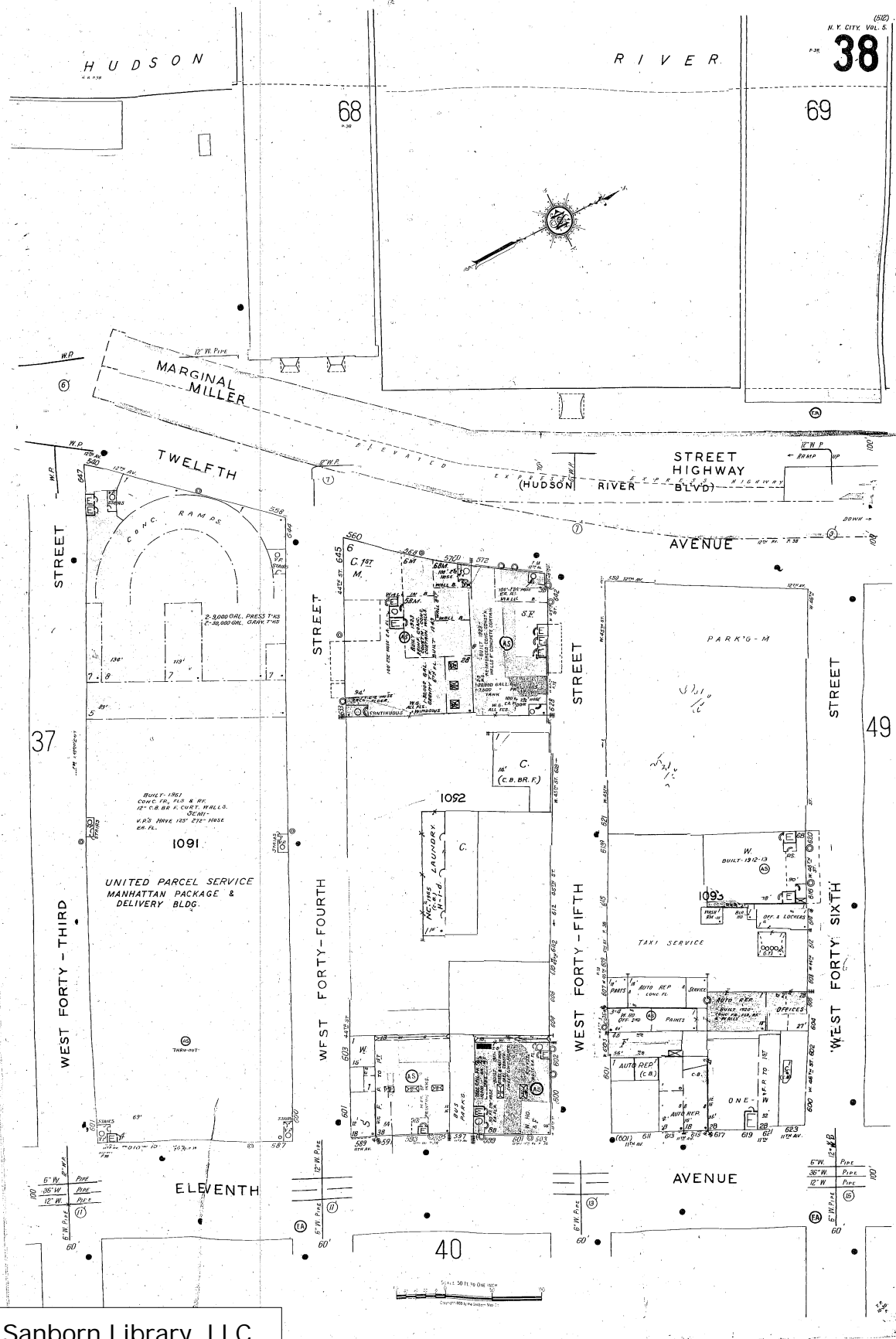


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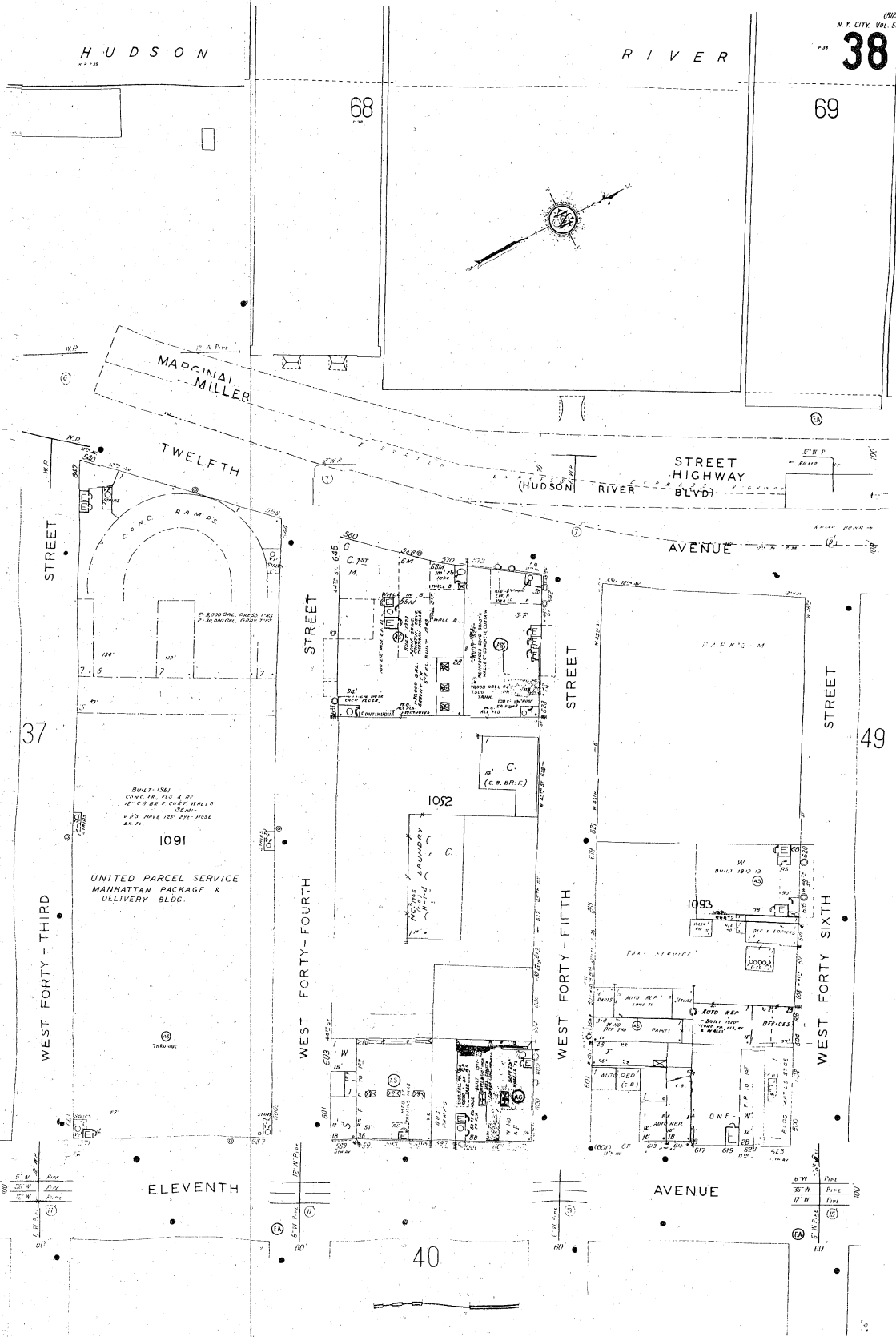


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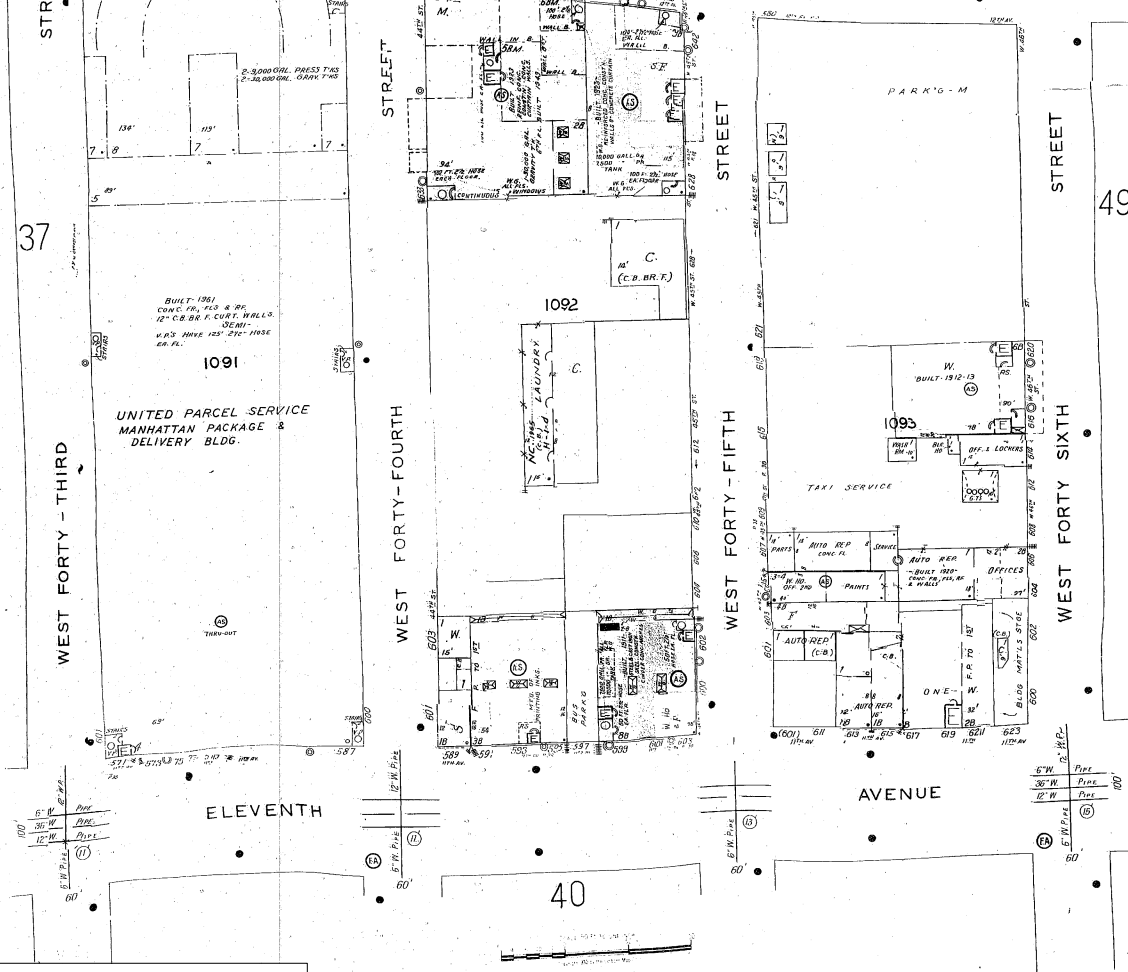
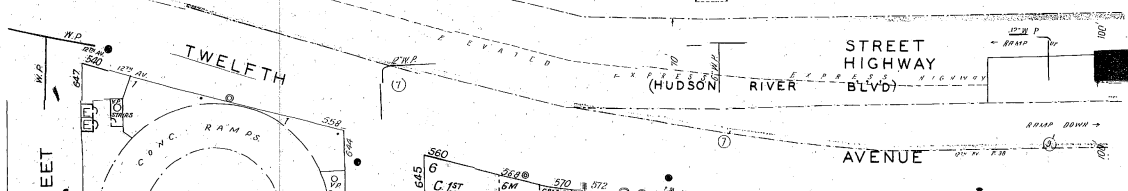
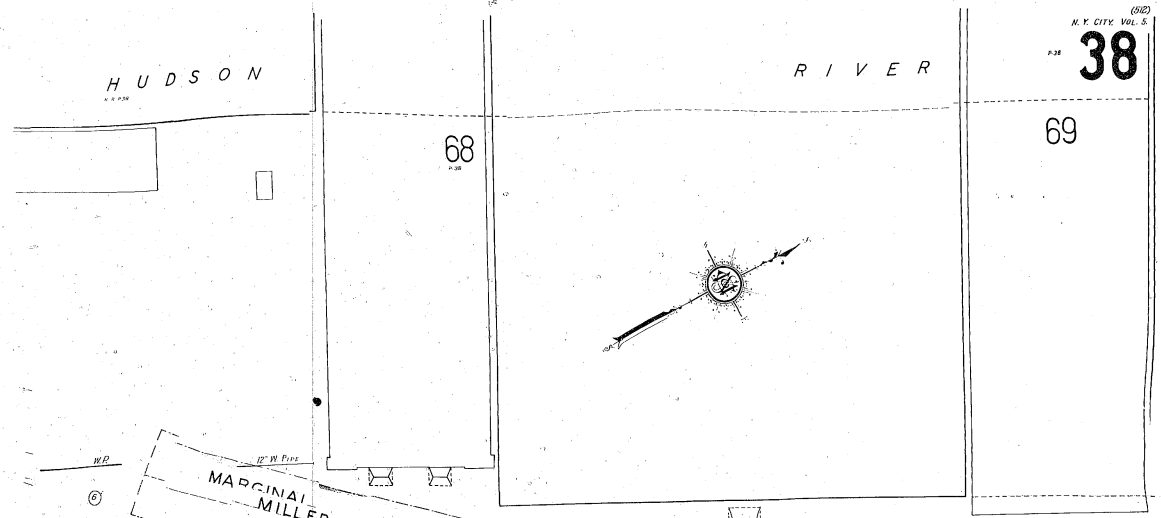


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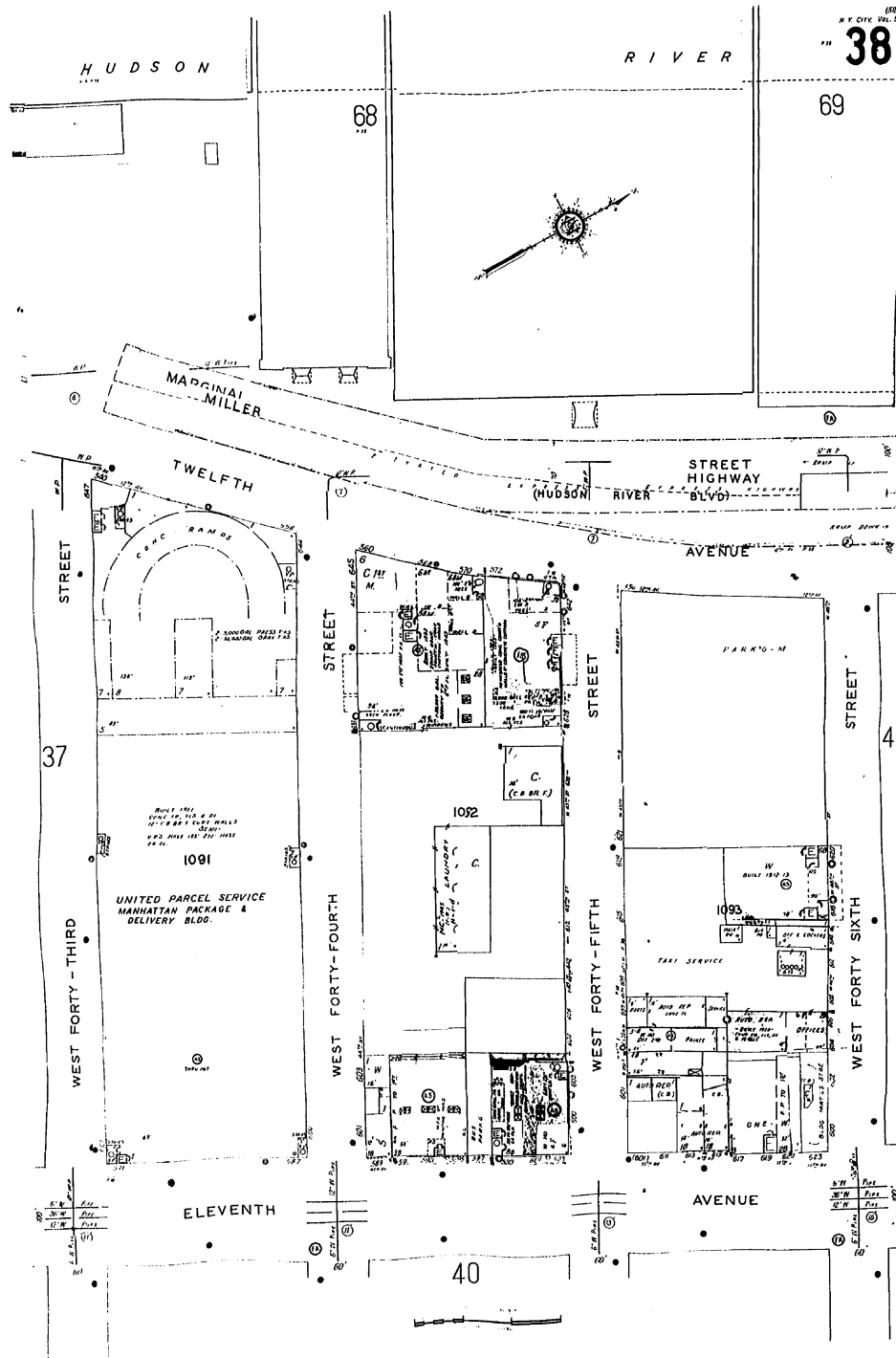
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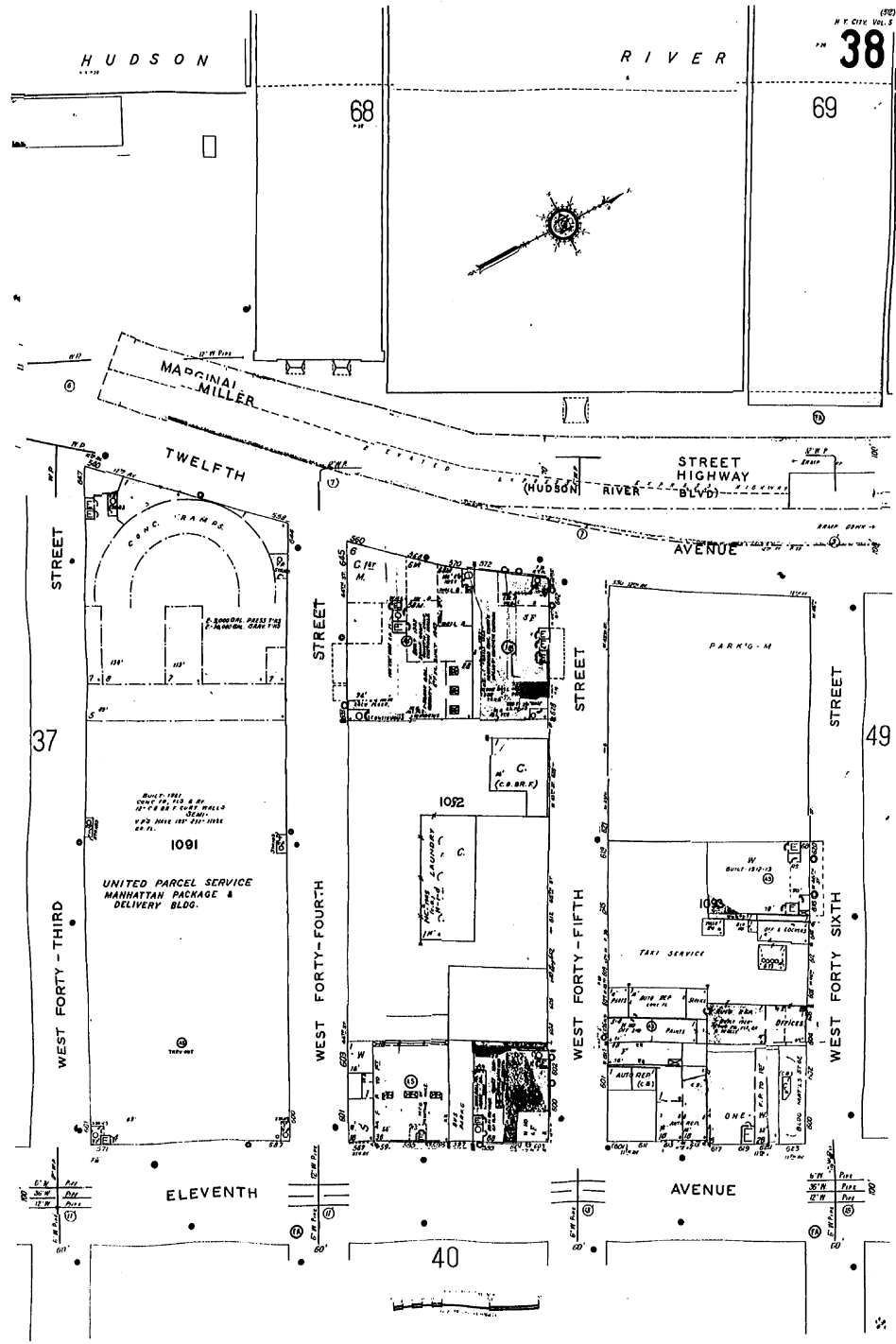


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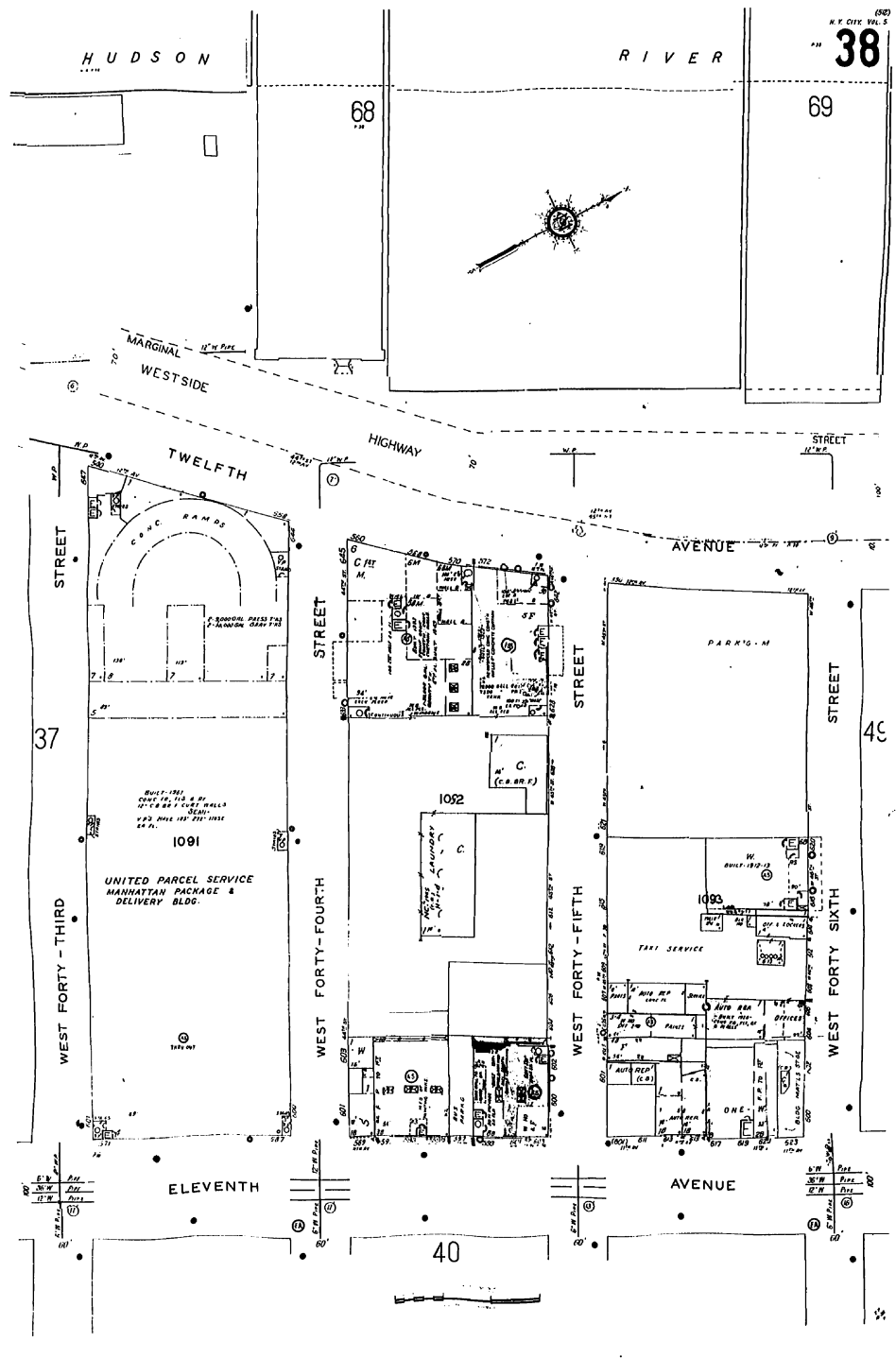


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HUDSON

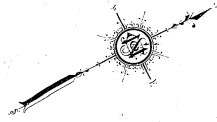
RIVER

N.Y. CITY. VOLS.

38

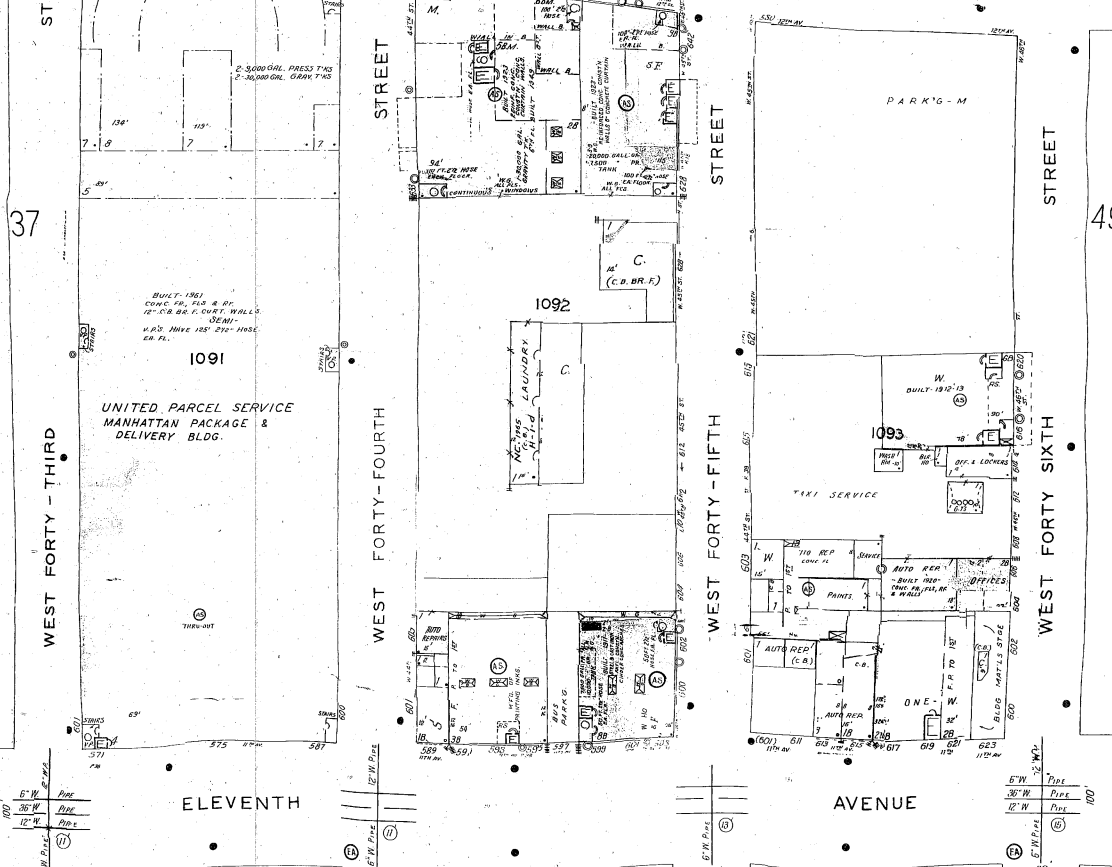
68

69



MARGINAL WESTSIDE  
12" W. P.M.  
70'

TWELFTH AVENUE  
HIGHWAY  
12" W.P.  
70'



38

49

ELEVENTH AVENUE  
5' W. P.M.  
30' W. P.M.  
12' W. P.M.  
60'

40



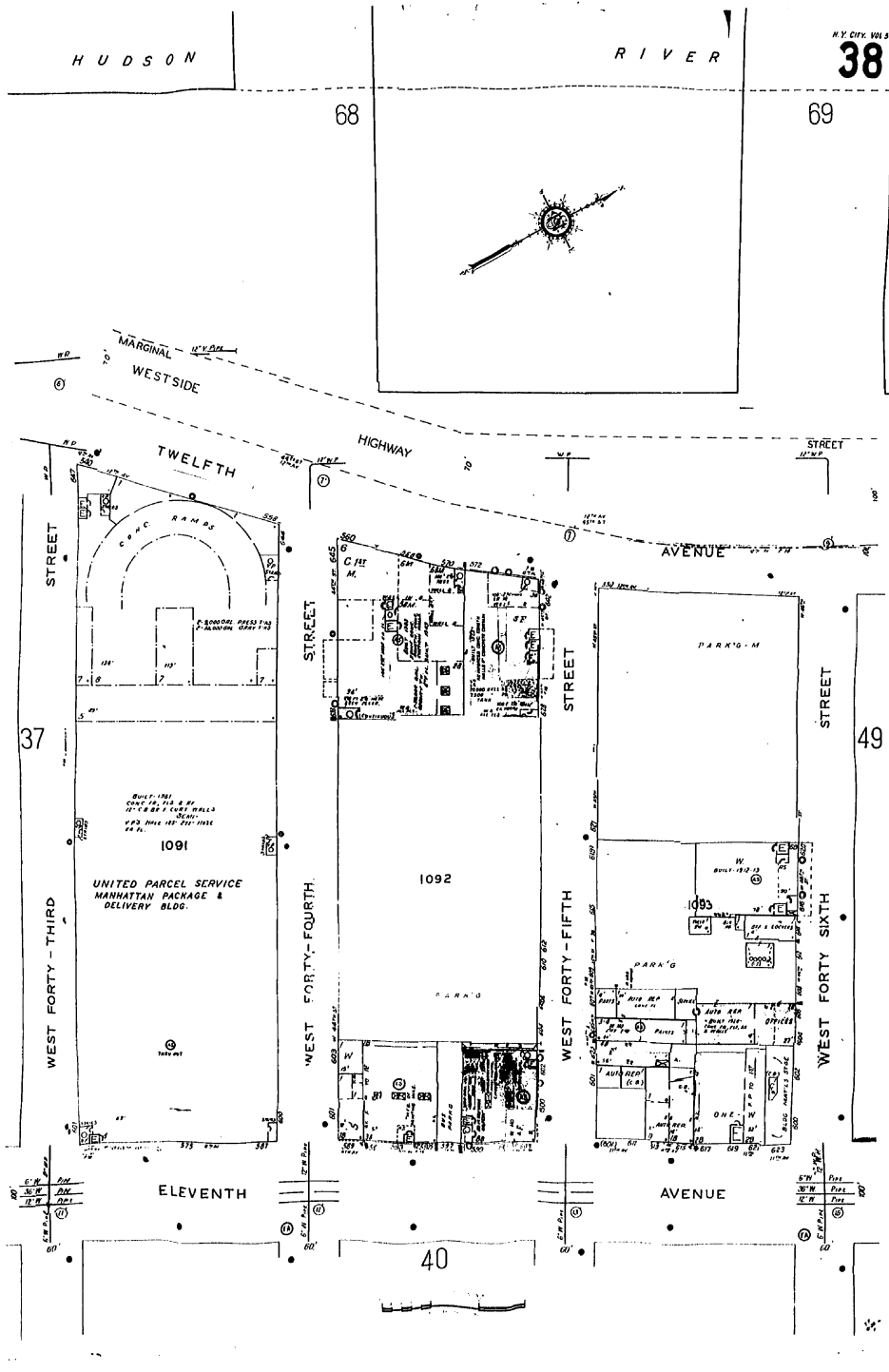
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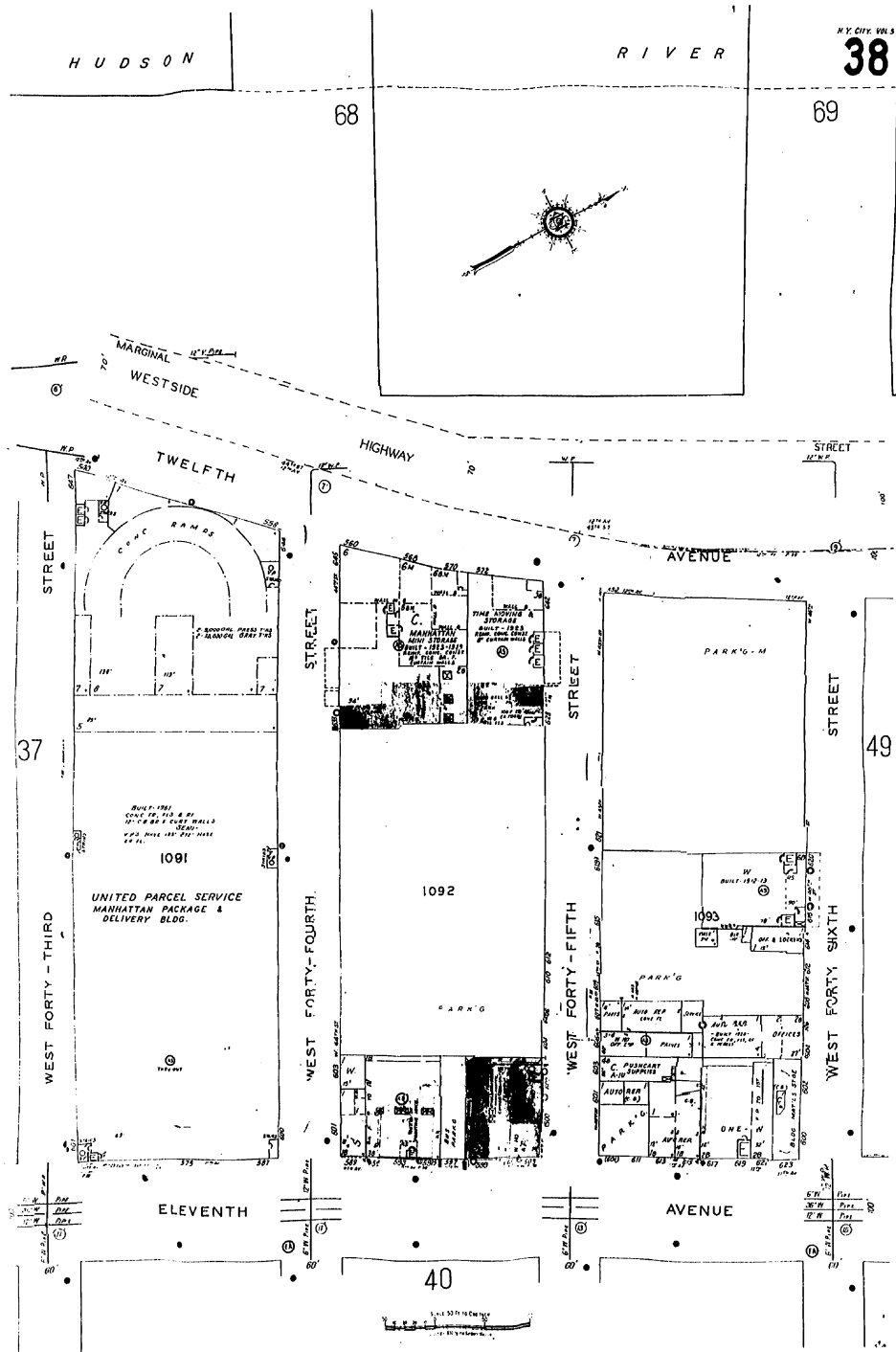


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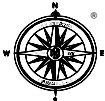
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**SITE PHOTOGRAPHS**

**APPENDIX B**  
**EDR REPORT**

**APPENDIX C**

**HISTORICAL MAPS, PHOTOGRAPHS, AND DATA**

**APPENDIX D**  
**TITLE SEARCH REPORT**