WEST 18TH STREET
MANUFACTURED GAS PLANT
SITE HISTORY REPORT

Prepared For:

Consolidated Edison Company of New York, Inc.

31-01 20th Avenue
Long Island City, New York 11105

Prepared By:

P a r s o n s

290 Elwood Davis Road, Suite 312
Liverpool, New York 13088
Phone: (315) 451-9560
Fax: (315) 451-9570

AUGUST 2002

Report For:

WEST 18th STREET MANUFACTURED GAS PLANT SITE HISTORY REPORT

Prepared For:

Consolidated Edison Company of New York, Inc.

31-01 20th Avenue
Long Island City, NY 11105

Prepared By:

P a r s o n s

290 Elwood Davis Road, Suite 312
Liverpool, New York 13088
Phone: (315) 451-9560
Fax: (315) 451-9570

REVIEWED AND APPROVED BY:

Project Manager: _____ _____
Date

Technical Manager: _____ _____
Date

AUGUST 2002

TABLE OF CONTENTS

Page

TABLE OF CONTENTS
(CONTINUED)

PAGE

TABLE OF CONTENTS
(CONTINUED)

PAGE

TABLE OF CONTENTS
(CONTINUED)

LIST OF FIGURES

TABLE OF CONTENTS
(CONTINUED)

LIST OF FIGURES

TABLE OF CONTENTS
(CONTINUED)

PAGE

LIST OF TABLES

TABLE OF CONTENTS
(CONTINUED)

LIST OF APPENDICES

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 18th Street MGP. 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 (VCA) between Con Edison and the New York State Department of Environmental Conservation (NYSDEC). To meet this objective, data was 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 18th Street MGP formerly existed on three city blocks (Blocks 688, 689, and 690) and portions of three more (Blocks 691, 666, and 715) in the Chelsea section of the Borough of Manhattan, New York City and New York County, New York. The West 18th Street MGP operated from circa 1834 through the early 1900s. Historical research and site reconnaissance identified the following key items for consideration in the prioritization of the former MGP sites:

- Industrial activities were conducted in the vicinity of the former West 18th Street MGP prior to the construction of the MGP. Industries identified included a steam mill, paint factory, whiting factory, wagon factory, distillery and "manufactory" of compressed yeast, and rectifying distillery.
- The former West 18th Street MGP operated from 1834 through the early 1900s. The gas plant was located on Block 689, and gas holders and storage yards were located on Blocks 688 and 690 and portions of Blocks 691, 666, and 715. Production of coal gas began at the site in 1834 by the Manhattan Gas Light Company and was continued by the Consolidated Gas Company, formed in 1884. The MGP continued to produce gas from coal until the early 1900s. Large-scale operations were discontinued in 1902-1903 when the City of New York obtained the western portions of Blocks 688, 689, 690, and 691 for the reconfiguration of 11th Avenue and the inland extension of the piers. Con Edison continued to use the buildings on Block 689 several years longer for distribution, shops, and experimental activities. Those gas holders that were not demolished for road reconfiguration continued to be used: the holders on Block 691 were taken out of service in 1909 and the holders on Blocks 690 and 715 were shut down in 1914. Some of the site structures on Block 689 were used by other tenants through the 1920s, but appear to have been demolished in the 1930s.
- Various lots from the former MGP were sold beginning in 1915 and new structures were built on portions of the site after the MGP structures were razed. The disposition of the materials from the razed structures is not documented. Some gas holders were offered for sale.

- With the exception of Block 715 that was always on solid ground, the entire West 18th Street MGP is located on landfill material. The nature and source of the fill material is unknown. Some of the fill was later excavated for the inland expansion of the piers. The disposition of the excavated material is unknown.
- The disposition of wastes and byproducts generated by the former MGP is not well documented.
- Based on the site reconnaissance and historical research, one structure associated with the former MGP may remain. This building is a warehouse that formerly housed two gas holders on Lot 59 on Block 715.
- Areas of the site that have not had significant excavation and redevelopment may retain remnants of the former MGP structures and may contain possible MGP residuals below the ground surface as found on Block 689 during subsurface investigation for a proposed FedEx facility.
- The area of the former West 18th Street MGP is a mixed use area with commercial properties including art galleries, office space, warehousing, trucking, parking lots, the Roxy night club, and high-rise and brownstone apartments. Schools are located within 0.25 miles of the site. The Chelsea Piers recreational facility is just west of the site.
- The Environmental Data Resources, Inc. (EDR) report indicates the potential exists for spills and leaks from other sources within the area. The report identified 15 Resource Conservation and Recovery Information System (RCRIS) small quantity generators and nine large quantity generators within 0.25 miles of the site. In addition, there are 29 underground storage tanks (USTs) and one bulk chemical storage tank within 0.25 miles and 53 leaking tanks within 0.5 miles of the former West 18th Street MGP.
- Soil sampling on Block 689 conducted by Melick-Tully and Associates, P.C. (MTA) in 1998 identified total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs) in soils and/or groundwater above NYSDEC soil or groundwater criteria (MTA, 1998c).
- Sampling by Allee, King, Rosen, & Fleming, Inc., (AKRF) for the Route 9A reconstruction project identified lead, PAHs, benzene, toluene, ethylbenzene and xylene (BTEX), and cyanide in samples collected near the former MGP (AKRF, 1994).
- If impacts are present at the site, potential receptors would include workers, nearby residents, and tourists visiting the area. Most of the former site is covered with pavement and buildings. Therefore, no exposure pathways for surface and subsurface soil are present. Workers conducting excavation or intrusive construction activities could encounter residues from past operations. There is no groundwater usage so the groundwater pathway is not complete. The EDR report shows a public water supply system site at 424 West 51st Street. However this is not the location of a well or production facility, it is the address of the owner of an upstate water supply located in Liberty, New York.
- The Hudson River is within 0.25 miles of the former MGP and could be impacted if MGP residuals are migrating from the site or if past disposal practices included disposal of MGP related materials in or near the Hudson River.

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 the results of the historical research conducted for the West 18th Street Gas Works, a former MGP located in the Chelsea section of Manhattan.

1.2 PURPOSE

This report documents the results of the historical research completed on the West 18th Street MGP, a former MGP located between West 16th Street and West 20th Street and 10th Avenue and the Hudson River (with one additional parcel on the block bounded by West 17th Street, West 18th Street, 9th Avenue and 10th Avenue) in western Manhattan, New York (Figure 1). The purpose of the historical research was to:

- Determine the physical limits of the former MGP operations.
- Develop an understanding of past operations at the former MGP.
- Identify products, byproducts, waste handling procedures, waste streams and potential hazardous substances and usage of the site to assess potential impacts if any, to adjacent properties and current site occupants.
- Develop historical and current site data that will support prioritization of the 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-MGP use, use during the MGP operation, and post-MGP use); a site reconnaissance to determine current conditions and neighboring property use; and a review of federal, state, and local databases to assess other sites in the vicinity that may be impacting the former MGP site and the neighboring properties.

Research undertaken as part of this report included a 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 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 and Harpers*);
- Environmental studies undertaken within and adjacent to the properties; and
- EDR radius search information.

Ms. Susan Shelton and Ms. Julie Abell Horn of Parsons conducted the site reconnaissance on May 15, 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 18th Street MGP site is located in the Borough of Manhattan, New York City and New York County, New York (Figure 1). The former West 18th Street MGP site covers portions of five modern city blocks, parts of 11th Avenue/Marginal Street/Route 9A, and parts of the Chelsea Piers (Figure 2). Specifically, the former MGP includes:

- Block 688, Tax Lots 1001 and 1002 (entire block bounded by West 16th Street, West 17th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 689, Tax Lot 17 (entire block bounded by West 17th Street, West 18th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 690, Tax Lots 12, 20, 29, 40, 42, and 54 (entire block [except Tax Lot 46] bounded by West 18th Street, West 19th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 691, Tax Lots 1 and 11 (western end of block bounded by West 19th Street, West 20th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 715, Tax Lot 59 (northwestern area of block bounded by West 17th Street, West 18th Street, 9th Avenue and 10th Avenue);
- The line of 11th Avenue, Route 9A, and Marginal Street between West 16th Street and West 20th Street (formerly parts of Blocks 688, 689, 690 and 691); and
- Portions of the Chelsea Piers (Piers 59, 60, 61 and 62) designated Block 662, (formerly part of Blocks 666, 688, and 689).

The western ends of Blocks 688, 689, 690, and 691 were truncated for the inland extension of the Hudson River piers (now designated Block 662, City 3, 7, 11, 16, 19, and 62) and the reconfiguration of 11th 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. Block 666, a wedge-shaped area formerly located west of Blocks 688, 689, and 690 along the Hudson River's edge, was condemned when the piers were extended inland. It should be noted that the existing Tax Lots are an amalgam of smaller real estate lots, which were historically sold to the Manhattan Gas Light Company (Con Edison's predecessor company) by individual owners. Section 5 of this report provides histories of the Tax Lots. Figure 3 shows the current street configuration with an overlay of the former MGP structures.

SECTION 3

CURRENT USAGE

3.1 GENERAL

The current usage of the former MGP property was determined from a site reconnaissance conducted on May 15, 2002. The site reconnaissance was supplemented with title search information, tax map information, and aerial photographs. The West 18th Street MGP site is located between West 16th Street and West 20th Street and 10th Avenue and the Hudson River (with one additional parcel on the block bounded by West 17th Street, West 18th Street, 9th Avenue and 10th Avenue) in western Manhattan, New York (Figure 1). The site is located in a mixed usage area with commercial properties including store front retail facilities to the east and west and a sports/entertainment complex located to the west and adjacent to the site. A mixture of commercial office/warehouse facilities, art galleries and residential properties are located to the north and adjacent to the site. An office facility and high-rise apartment building are located to the south. Details of current land use are described in the following paragraphs. Photographs of the site are provided in the Photo Log in Appendix A. Tables 3.1 through 3.4 present a summary of the current ownership and usage.

The former West 18th Street MGP site covers portions of five modern city blocks, parts of 11th Avenue/Marginal Street/Route 9A, and parts of the Chelsea Piers (Figure 2). Specifically, the former MGP includes:

- Block 688, Tax Lots 1001 and 1002 (entire block bounded by West 16th Street, West 17th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 689, Tax Lot 17 (entire block bounded by West 17th Street, West 18th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 690, Tax Lots 12, 20, 29, 40, 42, and 54 (entire block [except Tax Lot 46] bounded by West 18th Street, West 19th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 691, Tax Lots 1 and 11 (western end of block bounded by West 19th Street, West 20th Street, 10th Avenue and 11th Avenue/Route 9A);
- Block 715, Tax Lot 59 (northwestern area of block bounded by West 17th Street, West 18th Street, 9th Avenue and 10th Avenue);
- The line of 11th Avenue, Route 9A, and Marginal Street between West 16th Street and West 20th Street (formerly parts of Blocks 688, 689, 690 and 691); and
- Portions of the Chelsea Piers (Pier 59) designated Block 662 (formerly part of Blocks 666, 688, and 689).

3.2 BLOCK 688 LAND USE

Current land use on Block 688, consists a mixture of commercial and residential within multi-story structures. The western portion of Block 688, Tax Lot 1002 (frontage on 11th Avenue) is occupied by Manhattan Mini-Storage. Entrance to the storage facility may be gained along West 17th Street only (Photographs 6 and 8). Photographs are included in Appendix A. The eastern portion of Block 688, Tax Lot 1001 is occupied by a high-rise apartment building and commercial office facility. A parking facility is located within this building and vehicular entry/exit may be obtained along 10th Avenue. An elevated railroad easement runs along the northeastern corner of the lot. A spur from the elevated rails intersects the building located on Lot 1001 along 10th Avenue (Photograph 2).

During the site reconnaissance performed on May 15, 2002, no remnants of the former MGP were observed on this block. Based upon historic documentation, Block 688 formerly contained gas holders and coal yards. Due to limited site access, the status and condition of the building interiors could not be verified. The building and surrounding pavement did not display areas of extreme wear or degradation. Hazardous waste and petroleum usage, storage, or disposal was not observed at any of the structures on Block 688 during the site visit. No municipal solid waste containers were observed on or along the exterior of the structure. With the exception of wind-blown refuse and general litter, the area appeared well maintained.

Table 3.1 – Former MGP Lots In Block 688

Lot Number	Current Owner	Current Usage
Lot 1001	Able Empire Group, L.P.	Commercial office space and residential high-rise building.
Lot 1002	Tenth Avenue Mini Storage Associates	Storage facility.

Zoning Data:
Block 688, M1-5 – Light Manufacturing District (High Performance)

3.3 BLOCK 689 LAND USE

The portion of the site that includes Block 689, encompasses the entire block bounded by West 17th Street and West 18th Streets and 10th Avenue and 11th Avenues. The entire Block is designated as Tax Lot 17. An elevated railroad easement crosses the eastern portion of the lot (Photograph 15). Tax Lot 17 consists of a public/private parking lot (Photograph 9). Access to the parking facility may be obtained from 10th Avenue. The property is surrounded by chain-link fence topped with circular razor-wire. Partitioning material placed along the fencing reduced visibility into the facility. During the site reconnaissance performed on May 15, 2002 no remnants of the former MGP were observed on this block. Due to limited site access, the status and condition of the pavement could not be verified.

Table 3.2– Former MGP Lots In Block 689

Lot Number	Current Owner	Current Usage
Lot 17	Edison Mini Storage Corp.	Public/Private Parking Lot

Zoning Data:

Block 689, M1-5 – Light Manufacturing District (High Performance)

3.4 BLOCK 690 LAND USE

The portion of the site that includes Block 690, encompasses the entire block bounded by West 18th and West 19th Streets and 10th and 11th Avenues. Specifically, the former MGP occupied modern Tax Lot 12 and parts of 20, 29, 40, 42, and 54. Similar to Block 689, Block 690 also has an elevated rail easement crossing its eastern end, from West 18th Street to West 19th Street (Photograph 18).

The current land use on Block 690 represents a mixture of commercial usage. The western portion of the Block, with frontage along 18th Street, consists of a three story warehouse /garage facility (Photographs 11 and 12). During the performance of the site reconnaissance, no remnants of former MGP were observed on this portion of the block. Due to limited site access, the status and condition of the building interiors could not be verified. During the performance of the site reconnaissance on May 15, 2002, Lot 54 (with frontage along 11th Avenue) was vacant and surrounded on three sides by a privacy fence (Photograph 10). Due to the limited visibility caused by the fencing, the condition of the lot could not be verified. The eastern portion of Block 690, Lot 29 contains a commercial trucking parking lot (Photographs 17 and 18). The parking lot consisted of concrete and asphalt pavement. In some areas, asphalt patch appeared to cover cracks and/or areas of degraded concrete. In some areas, degraded asphalt patch material was also observed. The surface of the parking area did not appear to be flat and even. The parking lot is located over the former location of two gas holders.

Table 3.3 – Former MGP Lots In Block 690

Lot Number	Current Owner	Current Usage
Lot 12	Cotard Realty Associates	Garage/warehouse
Lot 20	Cotard Realty Associates	Garage
Lot 29	Somatic Realty	Commercial Trucking Facility
Lot 40	Haleakala, Inc.	Movie studio/warehouse
Lot 42	J. Craig Johnson and Henriette Johnson	Warehouse
Lot 54		Vacant Lot

Zoning Data:

Block 690, M1-5 – Light Manufacturing District (High Performance)

3.5 BLOCK 691 LAND USE

Block 691 is bounded by West 19th and West 20th Streets and 10th and 11th Avenues. Tax Lots 1 and 11 constitute the former gas company holdings within Block 691. Tax Lot 1 is located on the eastern portion of the block with frontage along 11th Avenue, West 19th, and West 20th Streets. The eastern portion of the block is currently occupied by commercial offices, art galleries, a parking facility and a warehouse (Photographs 19, 24, 25, 28, 30, 31, 32, and 34). The structures on Tax Lot 1 are in the same location as one of three former gas holders on Block 691. Tax Lot 11 is currently occupied by a parking facility that is in the location of another of the three former gas holders. The location of the third former gas holder is under modern 11th Avenue. During the performance of the site reconnaissance, no remnants of the former MGP were observed. Due to limited site access, the status and condition of the building interiors could not be verified.

Table 3.4 – Former MGP Lots In Block 691

Lot Number	Current Owner	Current Usage
Lot 1	New York State Urban Development Corp.	Commercial usage
Lot 11	Dora Heller et al.	Parking facility

Zoning Data:

Block 691, M1-5 – Light Manufacturing District (High Performance)

3.6 FORMER BLOCK 666 AND MARGINAL STREET LAND USE

The portion of former Block 666 that was owned by the gas company is currently occupied by a portion of Pier 59 and partially under water. Pier 59 currently operates as a sports and entertainment complex with frontage along 11th Avenue to the east and the Hudson River to the west (Photographs 4, 5 and 7). During the performance of the site reconnaissance on May 15, 2002, access to the buildings interior was limited. A visual inspection of the water surface along the pier and bulkhead did not reveal remnants of historic gas operations. Because odors associated with the high traffic area located adjacent to the pier were predominant, odors typically associated with historical MGP operations, if present, were not distinct.

The original western ends of Blocks 688, 689, 690, and 691 are now under the current alignment of 11th Avenue and Marginal Street. This area currently supports a multiple-lane, at-grade roadway separated by a median strip. During the performance of the site reconnaissance, no remnants of historic MGP operations were revealed. The roadway appeared to be in good condition (Photograph 7) and relatively well maintained.

SECTION 4

SITE SETTING

4.1 INTRODUCTION

This section describes the demography, current zoning, characteristics of the neighboring properties, topography, geology, and hydrogeology. Information in this section was developed during the site reconnaissance visit conducted on May 15, 2002 and through the collection and review of New York City tax and zoning files, historical reports, the radius search report, and USGS topographic maps.

4.2 DEMOGRAPHY

The population of the Manhattan Borough is 1,537,195 people. Census Tract 99 encompasses Blocks 688, 689, 690, and 691 (the site), the two blocks to the south, approximately 17 blocks to the north (to West 38th Street), and 11 blocks to the northwest (to West 39th Street). Census Tract 99 is wedge-shaped with the site falling near the southern point. Census Tract 99 widens to the north, becoming two blocks wide at 22nd Street. The site is bordered by Census Tracts 83 (8 blocks) and 89 (8 blocks). The population in Census Tract 99 is 1,155 people. The total population is ethnically diverse with 57-percent White, 31-percent Black, and 12 percent other races. There are slightly more females than males. The median age is 36.5 years. There are 309 renter occupied housing units and only 61 owner occupied housing units in Census Tract 99. The two Census tracts to the east of the former West 18th Street MGP are more heavily populated. Census Tract 83, adjacent to the southern half of the former MGP, has a population of 3,477 people and Census Tract 89, adjacent to the northern half of the former MGP has a population of 5,320 people. Renter occupied housing units significantly outnumber owner occupied housing units in both of these Census tracts too.

4.3 ZONING

Within the general geographic area of the site, property usage is light commercial, light industrial, local service district, and residential. All of the Tax Lots contained on the Blocks (688, 689, 690, and 691) that comprise the former MGP site are zoned as M1-5 and are defined as Light Manufacturing District - High Performance.

4.4 CHARACTERISTICS OF NEIGHBORING PROPERTIES

Within a one-quarter mile radius of the 18th Street site the neighboring properties consist of apartment buildings, restaurants, retail stores, art galleries, schools, parking lots, and warehouses. Two and three story apartment buildings are present to the north, south, and east of the site along 10th Avenue. Store front retail facilities are located to the east of the site as well with frontage along Amsterdam Avenue. The Chelsea Piers complex, an entertainment and recreational complex, is located to the west of the site along the Hudson River with frontage along 11th Avenue. During the site reconnaissance, the area buildings were observed to be generally well maintained. The roadways were observed to be in good repair with few pot holes observed. The

area maintains a high population density due to local apartments and the presence of the Chelsea Piers entertainment complex, art galleries, warehouses, and retail facilities as well as the influx of the workforce population on any given day of the work week.

4.5 TOPOGRAPHY AND SURFACE WATER DRAINAGE

The general site topography is subtly sloping from the east to west toward 11th Avenue and subsequently to the Hudson River. The elevation near the intersection of West 18th Street and 10th Avenue is approximately 12 feet above mean sea level (amsl) and the elevation near the intersection of West 18th Street and 11th Avenue is approximately 8 feet amsl. The elevation change across the site is approximately 4 feet.

Based upon observations made during the site reconnaissance visit, the apparent surface water drainage is west toward 11th Avenue and subsequently to the Hudson River. Storm sewers are present along 11th Avenue and 10th Avenue to collect surface water runoff from the adjacent side streets.

4.6 REGIONAL GEOLOGY

The bedrock underlying the project site is the Manhattan Formation, a 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 southwestern Manhattan area varies from more than 150 feet bgs in the Chelsea section near 21st Street to approximately 80 feet bgs, near the site (AKRF, 1994). Borings drilled on Block 689 encountered bedrock as deep as 90 to 100 feet (MTA, 1998a).

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 Wisconsonian Stage (the last of the four stages), large volumes of sand, gravel, and rock have been deposited along the margins of the Hudson River Valley (AKRF, 1994).

4.7 SITE GEOLOGY

The geology directly beneath the site is based on two borings (H-17 and BH-16) drilled as part of the Route 9A Reconstruction Project (AKRF, 1994) and 31 borings and three monitoring well borings drilled on Lot 689 by MTA, (1998a). Fill material is widespread in this region and consists of dredged river sediment, coal plant refuse, and construction debris in thicknesses of approximately 3-25 feet. Pockets of silts and sand are found between the fill and bedrock. (AKRF, 1994). Boring BH-16 encountered brown fine to coarse sand, with traces of silt and fine to medium gravel, brick, and ash fill to a depth of 13 feet, where the boring was terminated. Water was encountered at approximately five to 6 feet. Boring H-17 encountered fill consisting of black slag-like material with brick-like material and glass from near the surface to approximately 3 feet. Below the fill was light brown sand with silt and some gravel. Black-brown coarse to fine sand with abundant rock fragments and slight odor was encountered at approximately 9 feet. Water was encountered at approximately 6 feet. The boring was terminated at 10 feet. AKRF reports that in general, the overburden materials in the area consist of up to 35 feet of construction debris that may include brick, weathered schist, sand, silt, clay,

stone, and wood above a 10 to 40 foot layer of organic silt above a layer of up to 50 feet of glacial till (AKRF, 1994).

MTA conducted a subsurface investigation for a proposed Federal Express Distribution Center that would cover Block 689, (MTA, 1998a). MTA found roughly 20 to 40 feet of fill in Block 689 described as a heterogeneous mixture of silty sand, gravel, cinders, and frequent obstructions (upper 5 to 10 feet, particularly). The obstructions were concrete and brick rubble with other building demolition materials anticipated. Below the fill was up to 15 to 20 feet of organic silt found at depths of 20 to 25 feet near 10th Avenue and approximately 50 feet near 11th Avenue, when present. Below the organic silt is silty sand with cobbles and or boulders (inferred by drillers based on drilling characteristics). Discontinuous layers of medium to stiff clayey silt, from 5 to 15 feet thick, with varying amounts of sand were encountered at varying depths within and above the silty sand stratum on Block 689. MTA reported schist bedrock from 60 feet below the ground surface (bgs) near 10th Avenue to 100 feet bgs near the center of Block 689 (MTA, 1998a). The upper 5 to 20 feet of bedrock was found to be highly weathered. Groundwater was encountered at approximately eight to 11 feet below grade on Block 689. Results from rising head field permeability tests in monitoring wells found coefficients of permeability ranging from approximately $4X10^{-5}$ cm/second to $5X10^{-4}$ cm/second (0.1 to 1.3 feet per day), (MTA, 1998a).

4.8 HYDROLOGY/HYDROGEOLOGY

Manhattan is an island encompassing 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 a Class I surface water body adjacent to the West 18th 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 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). An EDR report for a site located at 42nd Street did identify a public supply at 424 West 51st Street. However, this is actually the location of the supply owner and not the supply. The public supply is actually located upstate in Liberty, New York. 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. However, the old channels may have some influence on the occurrence and movement of shallow groundwater in the region.

Depths to groundwater at the western end of the former West 18th Street MGP are approximately five to six feet (ADRF, 1994) and depths to groundwater on Block 689 are approximately 8 to 11 feet (MTA, 1998a). Depths to groundwater on the eastern end of the site are unknown. Groundwater is expected to flow in a northwesterly direction toward the Hudson River. Groundwater elevation contour maps are not available for the former West 18th Street MGP 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-MGP, the MGP period, and the post-MGP period. In addition to the title search results that are presented in Appendix D, Sanborn Insurance Maps from 1895 to 1996 and other historical maps and atlases were used to develop the chain of ownership and evolution of site operations.

The former West 18th Street MGP site occupied portions of five modern city blocks, parts of 11th Avenue/Marginal Street/Route 9A, and parts of the Chelsea Piers (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 Manhattan 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 18th Street MGP property supported various structures prior to its use as a MGP. The following text summarizes use on the properties on a block-by-block basis during these years. Of note, all of the blocks west of 10th Avenue were once under water, with the Hudson River shoreline located roughly along what would become 10th Avenue. The 1865 Viele map (Figure 4) shows the original topography and hydrology of Manhattan Island, the location of the original shoreline, and the 1865 shoreline. The stippled pattern identifies the areas that were filled between the original shoreline and the 1865 shoreline. The 1836 Colton map (Figure 5) shows an intermediate extent of filling with the eastern portions of Blocks 688, 689, 690, and 691 being reclaimed. By the early 1850s, Blocks 688, 689, and 690 were completely filled in, although Block 691 was still only partially filled. The 1852 Dripps map (Figures 6a through 6d) illustrates the extent of landfilling activities by this time. Other maps used to illustrate development in the following descriptions include the 1859 Perris and Company map (Figures 7a through 7e), the 1867 Dripps map (Figures 8a and 8b), and the 1869 Perris and Browne map (Figures 9a through 9d).

Block 688 (bounded by West 16th and West 17th Streets, 10th and 11th Avenues)

As described above, Block 688 was completely under water until the 1830s, when landfilling began west of 10th Avenue. By the late 1830s and early 1840s the eastern half of the block, now reclaimed from the river, supported two houses along 10th Avenue (Assessed Valuation of Real Estate 1836 through 1842). By 1857, there were fifteen houses along 10th Avenue; six houses, a stone yard, and two sheds on the south side of West 17th Street; and two houses east of 11th Avenue (Assessed Valuation of Real Estate 1857). These structures are depicted on the 1852 Dripps map (Figure 6a). On the eastern end of the block, various

residences, shops, a "Whiting Factory," a wagon factory, and a wood yard appeared on the 1859 Perris and Company map (Figure 7a) and the 1869 Perris and Browne map (Figure 9a).

Block 689 (bounded by West 17th and West 18th Streets, 10th and 11th Avenues)

There was little or no development on Block 689 prior to its use as an MGP. Until the early 1830s, the block was completely under water. Once the eastern end of the block had been filled, the Manhattan Gas Light Company purchased the lots along West 18th Street and part of 10th Avenue in 1833 from various owners. Concurrently, individuals bought lots and constructed five houses at the southeast end of the block, right next to the MGP (Assessed Valuation of Real Estate 1836 through 1842; 1857). The 1852 Dripps map (Figure 6a) shows the location of these structures on the block. These houses endured until the late 1850s, when the gas company bought these lots and razed the houses to make room for additional MGP buildings.

Block 690 (bounded by West 18th and West 19th Streets, 10th and 11th Avenues)

The earliest development on Block 690 was a steam mill, constructed by William Hockman on the south side of the block along the newly filled shoreline by the late 1830s or early 1840s (Assessed Valuation of Real Estate 1836 through 1842). The steam mill is visible (although unlabeled) on the 1852 Dripps map (Figure 6b). Individuals continued to own and occupy areas of the block adjacent to the MGP from the time that the Manhattan Gas Light Company began purchasing lots in 1848 until 1870, when the gas company acquired the last of the lots on the block. By the late 1850s, in addition to the property occupied by the gas company, the block contained a lumber yard, a coal yard, several houses, and various sheds and shanties (Assessed Valuation of Real Estate 1857). The 1859 Perris and Company map (Figure 7b) shows that in addition to the gas company structures, the block now contained a "Distillery and Manufactory of Compressed Yeast" complex, a paint factory, a cooperage (repair and making of barrels and tubs), and the "Manhattan Pottery" complex. The 1869 Perris and Browne map (Figure 9b) indicates the yeast factory was now a "Rectifying Distillery" and part of the Manhattan Pottery complex now housed the "Providence Chemical Works."

Block 691 (bounded by West 19th and West 20th Streets, 10th and 11th Avenues)

Block 691 contained primarily residences from the 1830s, when its eastern end was reclaimed from the Hudson River, through 1866, when the gas company purchased its first lots on the block. In the late 1830s and early 1840s, the block supported a stable and 8 houses (Assessed Valuation of Real Estate 1836 through 1842). The 1852 Dripps map (Figure 6b) illustrates the location of these structures. By 1857, the block had 19 houses, 8 lots with sheds, and a lumber yard (Assessed Valuation of Real Estate 1857). The 1859 Perris and Company map (Figure 7c) shows that the block now included a factory, a stone works, a cooperage, and a kindling wood yard in addition to the houses and two gas holders. Of note, it is likely that the 1859 Perris and Company map edition is actually an updated version of the map, changed sometime after 1866 to reflect a period after the gas company purchased the land on the block and erected its two gas holders there.

Block 715 (bounded by West 17th and West 18th Streets, 9th and 10th Avenues)

Unlike the blocks west of 10th Avenue, which were originally under water, Block 715, located east of 10th Avenue, was on solid ground. By the 1830s and 1840s, the block supported a number of houses and shops, although Tax Lot 59, the property later owned by the gas company, was vacant during these years (Assessed Valuation of Real Estate 1836 through 1842). In 1845 and 1846, individuals sold what would become Tax Lot 59 to the Manhattan Gas Light Company for construction of a building to house two gas holders.

Former Block 666 (bounded by West 16th and West 19th Streets, 11th and 13th Avenues)

The wedge-shaped portion of land created west of the original 11th Avenue alignment, between West 16th and West 19th streets, was designated Block 666 prior to its condemnation for inland pier extensions in the early twentieth century. Historic maps and documents divide this block into three parts: north, center, and south. The block was under water through the 1830s and early 1840s, but had been filled by the early 1850s, as shown on the 1852 Dripps map (Figure 6d). The southern part of Block 666 appears undeveloped. One unidentified structure is shown within the center part of Block 666 on the 1952 Dripps map. The gas company purchased the central part of Block 666 in 1846 and 1849 and the southern part in 1858. The unidentified structure is not present, replaced by a coal yard, in the 1859 Perris and Company map.

5.3 MGP HISTORY

The West 18th Street MGP had its beginnings in 1833. This was the year the Manhattan Gas Light Company purchased its initial property on the eastern end of Block 689 (the western end still being under water). The Manhattan Gas Light Company had formed in 1830, and by 1833, had acquired a franchise to provide gas to all of Manhattan north of Grand and Canal streets. It was the city's second gas company; the New York Gas Light Company began providing gas to the area south of Grand and Canal streets in 1825, using a plant at Hester and Centre streets. The West 18th Street MGP was to be the second gas plant in the city, and the first erected by the Manhattan Gas Light Company. Construction of the West 18th Street MGP began in the fall of 1833, and continued for the next year. Much of the original machinery was shipped from England. By November 1834, the plant was manufacturing and distributing coal gas to customers (Collins, 1934).

During the nineteenth century, the West 18th Street MGP grew as the Manhattan Gas Light Company continued to purchase land and construct additional parts of the facility. Table 5.1 summarizes the major land purchases associated with the West 18th Street MGP from the 1830s through 1870s.

Table 5.1 Summary of Land Purchases During the Nineteenth Century

Block	Historic Lot(s)	Modern Lot(s)	Year(s) Acquired
689	34-47	17	1833
715	51-59	59	1845, 1846
666	Center	Block 662, City 11	1846, 1849
689	19-33	17	1848
690	28-37	29	1848
689	17	17	1849
688	22, 43-45	1001, 1002	1858
689	Unspecified	17	1858
666	South	Block 662, now under water	1858
690	14-17, 48-53	12	1866
691	11-14, 52-57	1, 11	1866
690	18-19	12	1868
688	23-42	1001, 1002	1869
690	20-27, 40, 42-45	20, 40, 42	1870

As described above, the first property the company bought was on the south side of West 18th Street, at the eastern end of Block 689. Here, it built the nucleus of the MGP: a retort house, condensers, washers, and purifying house, likely contained in one or two structures. In 1845 and 1846, the company purchased lots on Block 715 and built its first gas holders, enclosed in a brick warehouse-type structure along the south side of West 18th Street. Around the same time, it purchased the center section of former Block 666, newly created by landfilling, which allowed direct access to the river and a company pier. It used this area as a coal yard as well. The purchase of more property at the eastern end of Block 689 in 1848 and 1849 allowed the MGP to expand its operations by constructing a new, detached purifying house at the northeastern corner of the block. This new purifying house implemented the dry-lime process (Collins, 1934 and Hartgen, n.d.). The company also bought land at the eastern end of Block 690, directly to the north, and constructed its first pair of large, open gas holders. The 1852 Dripps map (Figure 6a-d) illustrates the status of development at the West 18th Street MGP

after the first expansion of the facility on Block 689, the construction of the covered gas holders on Block 715, and the open gas holders on Block 690.

In 1853, the West 18th Street MGP was producing 300,000,000 cubic feet of gas annually, more than any other plant in the United States. Among its "modern improvements" were a high chimney for the retort house and pipes to transport its waste products (like tar, ammonia, and waste lime) directly into the river, polluting the area and driving away the fish. However, despite the company's efforts to get rid of some byproducts, residents still complained of the smell from the lime purifying process, at one point circulating a petition that finally prompted the company to install special ventilators that used new washing and purifying setups to remove the worst of the odors (Collins, 1934).

The 1859 Perris and Company map (Figures 7a through 7e) shows the next phase of the West 18th Street MGP configuration, and provides further details about existing site components. In 1858, the Manhattan Gas Light Company purchased the western two-thirds of Block 688, and the southern section of former Block 666. The company erected four additional gas holders in the middle of Block 688 and used the western end of that block as a coal yard. The newly purchased part of former Block 666 was used for a lime yard. The 1859 map indicates that the four new gas holders on Block 688 each held 250,000 cubic feet of gas, whereas the pair on Block 690 each had a capacity of 225,000 cubic feet. No dimensions are given for the two covered gas holders on Block 715, but other accounts indicate they were each 84 feet in diameter and held 205,000 cubic feet of gas each (PSC, 1909 and Collins, 1934). Two new gas holders are also shown on Block 691, in the location that the gas company purchased in 1866, suggesting either that the gas company was leasing this property before buying it, or more likely, that this map was updated between the 1859 and 1869 editions by "pasting over" pertinent sections, a common practice for insurance maps in the nineteenth century.

The 1859 Perris and Company map also shows the new layout of the MGP on Block 689. By this time, the retort house had been expanded to include six groups of 160 retorts each, for a total of 960 retorts. To the west of the retort house was a large coal house, where coal was stored after being unloaded from the adjacent waterfront pier, and prior to use in the retort house. To the east of the retort house was a laboratory along West 18th Street, and south of that, a building containing condensers, scrubbers and washers. Along 10th Avenue, the purifying house had been expanded and now stretched the entire length of the block. Adjoining the purifying house to the west was a series of structures labeled "Fresh Lime," "Meter House," and "Refuse Lime." Next to these structures, on the West 17th Street side of the block, were an engine and boiler house, and a bank of workshops. The interior of the block was designated a coke yard.

In 1862, a long article appeared in *Harper's New Monthly Magazine* describing the West 18th Street MGP and providing illustrations of the exterior plant buildings and gas holders, as well as a number of interior scenes. The article recounted a tour given by the chief engineer to the author and his nephew, in which they visited the draughting room (where architectural plans were rendered), the laboratory (where gas experiments occurred), the photometer room (where the candle strength of the gas was gauged), two rooms containing miniature gas manufacturing equipment to test the quality of coal, the retort house, the condensers, the washers, the purifying house, the gas holders, and the governor. The full article and accompanying illustrations are included in Appendix C. The *Harper's* article devoted particular attention to the Manhattan

Company's laboratory and other testing rooms, a sentiment that also had been made two years earlier in the *American Gas Light Journal*. That article explained "The Manhattan Company's new laboratory is the most extensive and costly in the United States; it may almost be called a National Laboratory, so general is the dependence of minor gas works upon the Manhattan Company for scientific experiments" (quoted in Collins, 1934:137).

The Manhattan Company's unqualified success during its first decades of operation allowed it to extend its facility even further during the ensuing years. In the late 1860s, the company purchased additional property on Blocks 688 and 690, as well as its first lots on Block 691. The MGP was expanded to include several large coal yards on Blocks 688, 690, and 691, a pipe yard on Block 690, and another pair of large gas holders on Block 691. In the early 1870s, the two gas holders on Block 715 were replaced (PSC, 1909 and Collins, 1934). The 1867 Dripps map (Figures 8a and 8b), the 1869 Perris and Browne map (Figures 9a through 9d), and the 1874 Perris and Browne map (Figures 10a through 10e) show the pace of development at the West 18th Street MGP during these years. The 1879 Taylor bird's eye drawing (Figure 11) illustrates the entire MGP for the first time, and clearly shows the massive coal piles on Blocks 688 and 690.

The West 18th Street MGP continued to operate through the final decades of the nineteenth century, although it did not acquire any additional property or change its configuration markedly during that period. After the Manhattan Gas Light Company joined with five other local gas companies to form the Consolidated Gas Company in 1884, some changes were made, such as the installation of new coal handling equipment at the West 18th Street MGP, and in the early 1890s, erection of a very large gas holder at the far western end of Block 691 (Collins, 1934). The 1887 Perris and Browne map (Figures 12a through 12d) and the 1895 Sanborn map (Figures 13a and 13b) illustrate the West 18th Street MGP during this period.

During the last decades of the nineteenth century, the city began plans to lengthen the Hudson River piers from West 11th Street to West 23rd Street, so as to accommodate longer ships. Originally, the hope had been to build the piers further into the river channel, but the Secretary of War rejected this idea, because it would have impeded navigation. Instead, the city decided to extend the piers inland, locating about one-third of their total length on solid ground. This procedure required excavating many of those areas that had been landfilled during the 1830s, and moving Marginal Street further inland. As a result, during the first decade of the twentieth century, the western ends of Blocks 688, 689, 690, and 691 were truncated, while 13th Avenue and Block 666 were eliminated completely (Hartgen, n.d.).

The West 18th Street MGP appears to have operated only one or two years into the twentieth century before it began to taper off production in preparation for the inland pier extension and road configuration work. The Docks and Ferries Department had a number of maps created from 1901-1905, illustrating the structures on the blocks that would be affected by the pier and road configuration, and numbering those structures that were to be sold at auction. Figure 14 is a sketch of Blocks 688 and 689, made in 1901. Figure 15 shows the large gas holder on Block 691 in 1903, Figure 16 illustrates the structures to be sold on Block 689 in 1904, and Figures 17 and 18 show the gas holders on Block 688 for sale in 1904 and 1905.

Documents describing the sale of gas holders on Blocks 688 and 691 during 1903-1905 included detailed descriptions. On Block 691, the text from the bid pamphlet in 1903 read:

The iron gas holder which extends practically from the northerly side of West Nineteenth Street to the southerly side of West Twentieth Street, and from a point about 10 feet east of the east side of Eleventh Avenue, easterly about 180 feet. This holder is about 180 feet in diameter, built in three lifts of about 45 feet each. All the iron or steel work of this holder including the columns and girders on the exterior, are to be removed down to the surface of the concrete foundation, which is about 5 feet below the sidewalk level. This removal includes the bottom iron plating on top of concrete foundation. The weight of the iron and steel to be removed is 3,600,000 pounds as estimated on the drawings of the structure. In connection with the holder above described, the one story brick building 13 feet by 20 feet, which is situated on the southeast side of the holder, is to be removed (Department of Docks and Ferries, 1903).

For Block 688, the text included this description of the gas holders and the conditions of sale in 1905 (no text for the sale in 1904 of the other two gas holders on Block 688 was found):

Part of each of two iron gas holders, which extend practically from the northerly side of West Sixteenth Street to the southerly side of West Seventeenth Street, and from a line about 270 feet westerly from the westerly side of Tenth Avenue to a line about 350 feet westerly from the westerly side of Tenth Avenue. These gas holders are each about 85 feet in diameter and are built in two lifts of about 30 feet each. All the iron or steel work of these holders lying to the west of the easterly line of the marginal street including the columns and girders on the exterior are to be removed down to the surface of the brick or concrete foundations.

That portion of the southerly gas holder which is to be removed according to the terms of this sale is estimated to contain about 150,000 pounds of iron or steel and its length along the circumference of the tank is 145.49 linear feet as shown on the accompanying map. That portion of the northerly gas holder which is to be removed according to the terms of this sale is estimated to contain about 36,000 pounds of iron or steel and its length along the circumference of the tank is 76.92 linear feet as shown on the accompanying map.

All the materials of every class and description composing the gas holders and their foundation shall be torn down to the level of the existing curb, except the materials composing the tanks or gas holders proper, which may be removed down to the level of the bottoms of the gas holders, said bottoms being about 22 feet down from the top of the brick wall which surrounds the gas holders, and all the material shall be entirely removed from the premises (Department of Docks and Ferries, 1905).

The remaining structures associated with the West 18th Street MGP continued to be used by the gas company after the western ends of Blocks 688, 689, 690, and 691 had been truncated. The 1904 Sanborn map illustrates the blocks after the streets had been reconfigured (Figure 19). According to the Public Service Commission, in 1907 the MGP was being "used for shops, distribution and experimental work, etc." (PSC, 1908:651). Six gas holders still remained in use at the MGP: two each (open) on Blocks 690 and 691 (holding 250,000 cubic feet each), and two (covered) on Block 715 (with a capacity of 205,000 cubic feet each), for a total capacity of 1,410,000 cubic feet (PSC, 1908 and 1909). In 1909, the two gas holders on Block 691 were

demolished, and in 1914, the remaining gas holders on Blocks 690 and 715 were razed (PSC, 1910 through 1914). During the 1910s, the gas company began to sell its property on the West 18th Street MGP blocks to other owners, marking the end of the MGP history.

5.4 POST-MGP OWNERSHIP AND USE

Con Edison no longer owns any of the former MGP property on Blocks 688, 689, 690, 691, or 715. The following discussion addresses use of these areas after the MGP was demolished in the mid-1910s, on a block-by-block basis. Sanborn maps (Figures 20 to 35) illustrate the sequence of development.

Block 688 (bounded by West 16th and West 17th Streets, 10th and 11th Avenues)

This block was owned entirely by the gas company, and now is designated Tax Lots 1001 and 1002. In 1916, the Consolidated Gas Company sold the whole block to the Merchants Refrigerating Company, and the following year the new owner constructed a ten-story warehouse with basement, covering the entire block. The refrigeration company operated from 1916 to 1982. The property was purchased by the Able Empire Group in 1982 and by the Tenth Avenue Mini Storage Associates in 1984. This building, although somewhat modified since its initial construction, still stands on the lot in its original location. Today it is occupied by condominiums and a mini storage facility.

Department of Building records indicate that prior to construction of the warehouse, engineers did subsurface testing to determine the stability of the soil. A report made in 1915 reveals that the water table was approximately 8.5 feet below grade, and that the amount of fill material extended from the ground surface to between 5-34 feet below the surface, depending on the location on the block (and the relationship to the original shoreline). In some cases, wood was noted within the fill, suggesting cribbing or docking material had been included with the soil, which was mostly sand. The report mandated that all foundations for the new building be excavated to "good sharp sand" (BIN 1012278).

Block 689 (bounded by West 17th and West 18th Streets, 10th and 11th Avenues)

Like the block to the south, Block 689 was owned entirely by the gas company, and is now designated Tax Lot 17. In 1917, the Consolidated Gas Company sold the whole block to the New York State Realty and Terminal Company. From 1932-1960, the property was owned by the New York Central Railroad Company. Since 1960, the block has been owned by a series of realty companies and corporations.

After the gas company sold the property, some of the former MGP buildings on the block were used for other purposes. The 1921 Sanborn map (Figure 20) shows by that period the retort house had been razed, but most of the other structures on the block were still standing. Some of the Sanborn maps have sections that are unreadable. This is the result of scanning or reproduction methods and the quality of the original maps (paste-over techniques were historically used to update maps). Information was gleaned from more readable copies located in archives visited. Along West 17th Street, the buildings were designated a "Wood Pulp Doll Factory," lumber storage, and a cooperage. The old purifying house, meter house, and lime house complex along 10th Avenue was being used by the United Electric Light and Power

Company for cable and pipe storage. The old condenser house in the interior of the block was designated "box storage," and the former laboratory along West 18th Street was marked "Packing Box Factory" and "Foundry." A small store, constructed after the retort house was demolished, was located along 11th Avenue near the intersection of West 18th Street.

The remainder of the old MGP buildings were razed after the railroad acquired the property, and a railroad yard (with tracks) was built in their place. Later, the tracks were covered and the block was used as surface parking for cars. The 1950 Sanborn map (Figure 21) shows the former railroad lines entering the block from 10th Avenue, with the later automobile parking lot superimposed. A small building labeled an office is located along West 17th Street. In the mid-1950s, an automobile service station and garage were also built along West 17th Street, near 11th Avenue, and first appear on the 1969 Sanborn map (Figure 22). The buildings were demolished in the 1980s. Today, the block is used exclusively as a parking lot. An overhead railroad viaduct crosses from West 17th Street to West 18th Street, near the eastern end of the block. The site has been evaluated for a multistory FedEx distribution center (MTA, 1998a, b, and c).

Block 690 (bounded by West 18th and West 19th Streets, 10th and 11th Avenues)

After Block 690 had its western end condemned for pier and roadway reconfigurations, nearly all of the remaining property on the block belonged to the Consolidated Gas Company. Specifically, the former MGP occupied modern Tax Lots 12, part of 20, 29, part of 40, 42, and 54. The various Tax Lots are identified in Figure 2. The following is a breakdown of development and use on these individual lots after being sold by the gas company from 1917 through 1923. Like the block to the south, Block 690 also has an overhead railroad viaduct crossing its eastern end, from West 18th Street to West 19th Street.

- Tax Lot 12 was used as a wagon yard until 1922, when a large garage (with buried gasoline tanks), was built over nearly the entire lot. This structure, with some modifications, still stands in its original location. It has three stories and a basement, and is made of steel and reinforced concrete.
- On Tax Lot 20, a large garage was erected over the portion fronting West 18th Street in 1919, and is still standing in its original location. It is several stories, and has/had buried gasoline tanks. The smaller portion of Tax Lot 20 along West 19th Street contained two row houses, built in the 1890s. They were razed for construction of a private garage, erected in 1947, which is still standing.
- Tax Lot 29 was used as a wagon yard after the gas holders were razed; it later became an automobile parking lot, and last, a truck parking lot. Two structures located on the southeast corner of the lot were built in the mid-1920s. The larger structure was originally a diner, but then changed its function to an office. The smaller structure was a watchman's house, and now serves as an office. The lot contains underground gasoline tanks.
- Tax Lot 40 originally contained two halves: the Consolidated Gas Company owned one part, and used it as a pipe yard, while the second part was owned by other individuals, and contained a shop, which later became an automobile repair facility. In 1923, the Huntoon Ice Company purchased both halves of the lot, and in 1929, constructed a warehouse for ice storage over the entire lot. In 1969, Eli Studios

purchased the building and lot; the former warehouse has been used as a movie studio since that time.

- Tax Lot 42 was sold to the Huntoon Ice Company in 1922, which erected a two-story warehouse the following year. The building later was occupied by a spring water company. It is still standing in its original location.
- Tax Lot 46 was never owned by the gas company, but was surrounded by the MGP property on all sides. The lot was used as a lumber yard during the MGP period, and by the 1920s, a garage had been built, which is still standing.
- After sale by the gas company, tiny triangular Tax Lot 54 located at the corner of West 19th Street and 11th Avenue contained a two-story hotel, which later burned. The lot has been vacant since the 1960s.

Block 691 (bounded by West 19th and West 20th Streets, 10th and 11th Avenues)

Modern Tax Lots 1 and 11 constitute the former gas company holdings on Block 691. After the gas holders were demolished, Tax Lot 1 contained a small office building at its northwest corner while the rest of the property was vacant and used as a "house wrecker's yard." The eastern portion of Tax Lot 11 was used for the Department of Street Cleaning's wagon yard. The American Red Cross had a structure along the 11th Avenue side of the block during the 1920s, covering parts of Tax Lots 1 and 11. In 1929, the YMCA of New York purchased Tax Lot 1, and the following year constructed an eight-story building (with basement) for use of its members (after the American Red Cross building was razed). This building, with minor alterations, remains on the lot in its original location today. Tax Lot 11 has been vacant since the American Red Cross building was demolished, and currently is used as a parking lot.

Block 715 (bounded by West 17th and West 18th Streets, 9th and 10th Avenues)

Tax Lot 59 contains the former gas holder house, now used as a garage. Although the gas holders have been removed and the building has been retrofitted, the exterior shell of the building has changed little.

Former Block 666 (bounded by West 16th and West 19th Streets, 11th and 13th Avenues)

The gas company formerly owned the southern and central thirds of Block 666. When the piers were extended inland and the roads reconfigured, this block was eliminated. The southern and northern parts of former Block 666 are now under water, while the center section falls partially within the current footprint of Pier 59 (Chelsea Piers Sports and Entertainment Center), and partially under water.

11th Avenue/Marginal Street (between West 16th and West 20th Streets)

The original western ends of Blocks 688, 689, 690, and 691 are now under the current alignment of 11th Avenue and Marginal Street or were removed during waterfront modifications, which were laid out in the first decades of the twentieth century. By the 1930s, this roadway also supported the elevated Miller Highway, which was demolished in the early 1970s

(Hartgen, 1994). Today this area supports multiple-lane, at-grade roadways separated by a wide median strip.

5.5 SUMMARY

Tables 5.2 through 5.6 present a summary of the significant property transfers on Blocks 688, 689, 690,691, and 715 which occurred during the formation of the West 18th Street MGP, during the operations of the MGP, and the dissolution of the MGP after the early twentieth century.

Table 5.2

Block 688 – Property Transfers

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/ Grantee	Comments
1858	22, 43-45, and pier	Johnson family	Manhattan Gas Light Co.	Now Tax Lots 1001 and 1002, 11th Ave. and Marginal Street.
1869	23-42	Trustees of Ellen Ward	Manhattan Gas Light Co.	Now Tax Lots 1001 and 1002.
1885	Entire block	Manhattan Gas Light Co.	Consolidated Gas Co.	Consolidated Gas Co. organized in 1884.
1916	Entire block	Consolidated Gas Co.	Merchants Refrigerating Co.	Now Tax Lots 1001 and 1002.
1982	Entire block	Buffalo Refrigerating Co.	Able Empire Group, L.P.	Property split into Tax Lots 1001 and 1002 in 1983.
1984	1002	Able Empire Group	Tenth Avenue Mini Storage Associates	Company now called Tenth Avenue Mini Storage Associates, LLC.

Table 5.3

Block 689 – Property Transfers

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/ Grantee	Comments
1833	34-47	Various owners	Manhattan Gas Light Co.	Now Tax Lot 17. Split ownership of lots.
1848	19-33, 38-47	Sheriff of New York	Manhattan Gas Light Co.	Now Tax Lot 17. Sheriff's office selling for City of NY, foreclosed or condemned lots.
1849	17	Mayor of New York	Manhattan Gas Light Co.	Now Tax Lot 17.
1885	Entire block	Manhattan Gas Light Co.	Consolidated Gas Co.	Consolidated Gas Co. organized in 1884.
1917	Entire block	Consolidated Gas Co.	NY State Realty and Terminal Co.	
1932	Entire block	NY State Realty and Terminal Co.	NY Central Railroad Co.	
1960	Entire block	NY Central Railroad Co.	10-42 Corp.	
1964	Entire block	10-42 Corp.	Irving Maidman	
1965	Entire block	Irving Maidman	Chatham Associates, Inc.	
1971	Entire block	Chatham Associates, Inc.	Avon Associates, Inc.	
1978	Entire block	Avon Associates, Inc.	Empire Associates Realty Co.	
1983	Entire block	Empire Associates Realty Co.	Edison Mini-Storage Corp.	

Table 5.4

Block 690 – Property Transfers

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/ Grantee	Comments
1848	28-37	William and Marianna Powers	Manhattan Gas Light Co.	Now Tax Lot 29.
1866	14-17, 48-53	Hockman family	Manhattan Gas Light Co.	Now Tax Lot 12.
1868	18-19	Mary Handley	Manhattan Gas Light Co.	Now Tax Lot 12.
1870	20-27, 40, 42-45	Various owners	Manhattan Gas Light Co.	Now Tax Lots 20, 40, 42.
1885	14-37, 40, 42-45, 48-53	Manhattan Gas Light Co.	Consolidated Gas Co.	Consolidated Gas Co. organized in 1884.
1917	28-37	Consolidated Gas Co.	NY State Realty and Terminal Co.	
1919	20-27	Consolidated Gas Co.	Moriana Realty Corp.	Now part of Tax Lot 20.
1922	12	Consolidated Gas Co.	Ambro Stores and Garage Corp.	
1922	42	Consolidated Gas Co.	Huntoon Ice Co.	
1923	Part of 40	Consolidated Gas Co.	Huntoon Ice Co.	
1925	12	Alfred Towney, referee	Whitlock Ave. 156th St. Realty Co., Inc.	
1928	20-27	Moriana Realty Corp.	U.S. Trucking Corp.	Now part of Tax Lot 20.
1933	29	NY State Realty and Terminal Co.	NY Central Railroad Co.	
1943	12	Thomas Chimera, referee	Trustees of Columbia University	
1946	12	Trustees of Columbia Univ.	National Garage Corp.	

Table 5.4

Block 690 – Property Transfers (Continued)

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/ Grantee	Comments
1956	40, 42	Rubel Corp.	Kenmar Corp.	
1959	29	NY Central Railroad Co.	National Garage Co.	
1959	40, 42	Kenmar Realty	Mar-Ken Realty Corp.	
1961	40	Mar-Ken Realty Corp.	Jeff Rich Realty Corp.	
1961	42	Maidmor Realty Corp.	Irving Maidman	
1969	40	Jeff Rich Realty Corp.	Eli Studios	
1970	42	Eagle Spring Water Co., Inc.	Foremost McKesson, Inc.	
1977	42	Foremost McKesson, Inc.	Criette Realty, Inc.	
1978	20	United States Trucking Corp.	Cotard Realty Associates	
1979	40	General Stage 19, Ltd.	Dia Art Foundation, Inc.	
1981	12, 29	National Garage Co.	Cotard Realty Associates	
1986	42	Criette Realty, Inc.	J. Craig Johnson and Henriette Johnson	
1987	40	Dia Art Foundation, Inc.	Haleakala, Inc.	
2001	29	Cotard Realty Associates	Somatic Realty LLC	

Table 5.5

Block 691 – Property Transfers

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/ Grantee	Comments
1866	11-14, 52-57	Clement Moore heirs	Manhattan Gas Light Co.	Now Tax Lots 1 and 11.
1885	11-14, 52-57	Manhattan Gas Light Co.	Consolidated Gas Co.	Consolidated Gas Co. organized in 1884.
1910	1, 11	Consolidated Gas Co.	Warwick Thomson Co.	
1926	1, 11	Warwick Thomson Co.	City Real Estate Co.	
1926	1, 11	City Real Estate Co.	Consolidated Gas Co.	
1929	1	Consolidated Gas Co.	YMCA of NY	
1945	11	Consolidated Gas Co.	Deposit Realty, Inc.	
1947	11	Deposit Realty, Inc.	Chelsea Holdings, Inc.	
1961	11	Chelsea Holdings, Inc.	Nathan and Dora Heller	
1965	11	Nathan and Dora Heller	Nathan Heller et al.	
1984	11	Dora Heller	Dora Heller et al.	
1993	1	State of New York	New York State Urban Development Corp.	

Table 5.6

Block 715 – Property Transfers

Date of Transaction	Tax Lots	Seller/Grantee	Purchaser/ Grantee	Comments
1845	51-57	Samuel H. Turner	Manhattan Gas Light Co.	Now Tax Lot 59.
1846	58-59	John and Helen Ferguson	Manhattan Gas Light Co.	Now Tax Lot 59.
1885	51-59	Manhattan Gas Light Co.	Consolidated Gas Co.	Consolidated Gas Co. organized in 1884.
1944	59	Consolidated Gas Co.	440 West 18th St. Realty Corp.	Property had been leased to others since 1915.
1983	59	440 West 18th St. Realty Corp.	Retaco Holding Corp.	

SECTION 6

PAST SITE OPERATIONS

6.1 INTRODUCTION

This section describes the operations conducted at the former West 18th Street MGP in addition to significant operations conducted before and after the MGP. This section is divided into three parts; pre-MGP operations, MGP operations, and Post MGP 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;
- 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-MGP OPERATIONS

6.2.1 Summary of Pre-MGP Operations

Prior to the existence of the West 18th Street MGP, Blocks 688, 689, 690, 691, and 715 supported a variety of structures. Historic maps and tax assessment records indicate that most of the pre-MGP uses of these blocks were for houses and sheds, as well as storage yards for coal, lumber, and stone. In addition, however, several blocks supported industrial operations. Block 690 contained a steam mill, a compressed yeast distillery and factory (later a rectifying distillery), a paint factory, a cooperage, a pottery, and a chemical works. Block 691 included a factory, a stone works, and a cooperage. Other operations on the blocks included landfilling associated with shoreline extension.

6.2.2 Pre-MGP 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 MGP began operations. Potential wastes generated may include scrap wood and stone from the storage yards and scrap wood from the cooperage. The pottery would have scrap pottery from broken or off-spec. pottery products. The pigments and glazes may have contained contaminants. The paint factory could have solvents, pigments, and possibly lead used in the making of the paints. The chemical factory could have had a wide range of products, byproducts, and wastes. The yeast distillery and rectifying distillery likely had byproducts left after the distilling process. The various operations needed sources of energy (steam mill, distillery, paint factory, pottery, chemical works, and stone works). Depending on the nature of the energy and storage, various contaminants could be released. Metals could leach from coal piles. The various operations likely used grease and other lubricants. The landfilling operation associated with the shoreline extension could have used or incorporated ash, cinders, and other solid wastes or byproducts from the nearby industries.

6.3 MGP OPERATIONS

6.3.1 Summary of Site Gas Production

The processes and practices described in the following sections are drawn from *Harper's New Monthly Magazine* (1862), historic maps, Con Edison records, Collins (1934), Hartgen (n.d.), Public Service Commission (PSC) Records, Brown's Directories, Eng (1985), Hornby (1911), Alrich (1934), Downing (1934), Stewart (1958), and EEI (1984).

The West 18th Street MGP manufactured retort or coal gas from 1834 to the early 1900s (Collins, 1934 and Department of Docks and Ferries 1903 through 1905). Anthracite coal for coal gas production was delivered by barge or lighter to the Hudson River waterfront piers, and then by cart to the plant itself, located on Block 689. The West 18th Street MGP used both English and American coals, mixing them together to create a blend (*Harper's*, 1862). The coal was stored in a large "coal house" at the western end of the block, then transported to the retort house. At the eastern ends of the retort house were the condensers and scrubbers. Last, the gas went through the purifying house, located at the far eastern end of the block. From the purifying house the gas went to the holders at various locations on Blocks 688, 690, 691, and 715 for storage before being distributed to customers. At its peak, the West 18th Street MGP had 11 gas holders, with a combined capacity of approximately 3,500,000 cubic feet (PSC, 1908). The following text summarizes the coal gas manufacturing process, from delivery of the coal to the retorts, to the piping of gas to the holders.

6.3.2 Summary of Process Configurations

As described above, coal gas was produced at the West 18th Street site between 1834 and the early 1900s. Coal was delivered by barge or lighter and unloaded at the company's Hudson River pier, and may also have been delivered by rail, as tracks ran along 10th Avenue on the eastern side of the MGP. By-products may have been shipped from the plant by barge or rail also.

The retort house was constructed of brick, and consisted of a furnace supporting a series of clay retorts on brick benches. Each bench contained 15 retorts, and there were 64 benches, for a total of 960 retorts (Perris and Company, 1859 and *Harper's*, 1862). The retorts were heated by lighting fires below them, which then surrounded the chamber and heated the coal inside the

retorts without air. Prior to the 1880s, when mechanized chargers and dischargers were installed at the plant, groups of workers loaded and unloaded coal into the retorts manually, using large shovels each holding about 100 pounds of coal. Once the retorts were filled with coal (or "charged"), the retort was heated for several hours until gas resulted. Once the gas was removed, the coal (at this stage called "coke"), now enlarged to nearly twice its original size (although much less dense) was removed from the retorts. According to the *Harper's* article, in the 1860s half of the coke produced was used at the plant to heat the retorts again or for other purposes, and half was sold. The spent coal or coke was discharged through the bottom of the oven and immediately quenched with water to prevent combustion (*Harper's*, 1862; Hartgen, n.d.; and EEI, 1984).

The retort gas was passed through a series of processes to recover byproducts and impurities. Once the raw gas was driven from the coal, it was drawn from the retort and through a hydraulic main located on the roof of the retort house. The main was sealed and contained water, which permitted steam, tar vapors, and some ammonia compounds to settle out before continuing to the condensers. From the hydraulic main, the gas traveled to the air condenser, located immediately east of the retort house. The air condenser cooled the gas by indirect contact cooling water to remove heavy tars and water vapor. Tar byproducts were siphoned off at this stage, for reuse or sale. The gas was then fed through a second, water cooled condenser, located just east of the air condenser, to remove additional impurities. Next, the gas flowed through an exhauster, situated south of the condensers, which blew the gas through the scrubber or washer (located east of the condensers) to remove ammonia and some sulfur. The *Harper's* article noted that 8-10 gallons of ammonia could be extracted from the gas produced by one ton of coal. The scrubber was a cylindrical structure filled with coke; materials in the scrubber were sprayed with water, and those water soluble impurities settled to the bottom of the chamber, where they were collected (*Harper's*, 1862 and Hartgen, n.d.).

The final stage in the removal of impurities from the gas stream, purification, was the removal of sulfur. Sulfur was removed from the gas stream by the formation of calcium sulfate as the coal gas was passed through lime purifiers. The purifiers consisted of square tanks in which stacked trays containing damp, powdered lime, were situated. The gas was forced up from beneath the trays, in the process removing sulfurous compounds like hydrogen sulfide through reaction with the calcium in the lime. At the West 18th Street MGP, a fresh lime house was attached to one side of the purifying house, while a foul lime house was located at the other end. The spent lime could then be sold for fertilizer (*Harper's* 1862, and Hartgen, n.d.).

From the purifiers, the gas was metered and then passed into a storage holder, ready for distribution to the customers. The West 18th Street MGP began with only two gas holders (on Block 715), but over time constructed a number of others. By the turn of the twentieth century, there were eleven holders on four contiguous blocks, with a combined capacity of 3,500,000 cubic feet.

6.3.3 By-Products and Waste Disposal

A complete record of by-product quantities, reuse, sale, and disposal is not available. PSC reports began publication in 1908, after the West 18th Street MGP had essentially stopped

producing gas. During the period that the West 18th Street MGP operated, there were no known published reports detailing byproduct output and sales.

Typical wastes and byproducts produced at an MGP would include coal tar, ammonia, purifier wastes (calcium sulfate and/or spent ferric oxide impregnated wood chips), sulfur, coal ash and cinders. It is not known if purifier waste (calcium sulfate and/or ferric oxide) was stock piled prior to or after use on-site. The disposal history of purifier waste is unknown. The coal tar was sold as a byproduct as was the sulfur. The coal tars could be distilled producing ammonia liquors, light oils, creosote oils, anthracene oils, and pitch. The light oils could be further rectified yielding benzol, solvent naphtha, carbolic acid, and anthracene. Improvements to the MGP around 1853 included pipes to transfer waste products directly into the river, resulting in pollution of the area and driving the fish away (Collins, 1934).

6.4 POST-MGP OPERATIONS

Section 5.4 describes the history of the West 18th Street MGP 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.

Block 688 (bounded by West 16th and West 17th Streets, 10th and 11th Avenues)

The portion of this block not truncated by roadway reconfiguration consists of Tax Lots 1001 and 1002 (which are parts of the same lot). The entire expanse of Tax Lots 1001/1002 has, since 1917, contained a ten-story building with basement, covering the entire block. Over most of its use-life the building was used as a warehouse, and today it is occupied by condominiums and a mini storage facility. Wastes and potential contamination associated with the warehouse would be related to the types of materials stored. The far western part of the block overlies the area of the MGP formerly containing gas holders, while the remainder of the block overlies the gas company's former coke yard (Sanborn 1895, 1904). Before acquisition by the gas company for the coke yard, the eastern part of the block contained various residences, shops, a "Whiting Factory," a wagon factory, and a wood yard (Perris and Company 1859; Perris and Browne 1869). Department of Docks and Ferries documents indicate that the gas holders had to be removed down to the top of their foundations (at approximately 5 feet below grade), but were permitted to be removed to the base of these foundations (at approximately 22 feet below grade), presumably if bidders wished to recoup additional resale value of the foundation materials. Sometimes the holders were reconstructed at a new location. However, it is not known whether all of the foundations were in fact removed. In 1915, though, Department of Building records indicate that the foundations of the current building on the block were to be excavated deeply, through the landfill to underlying natural sand. Since the existing building has a basement, it is likely that if the foundations for the gas holders had not been completely dismantled in 1905, they were removed prior to construction of the new building.

The western end of original Block 688 is currently under 11th Avenue and Marginal Street. This section of the block once contained gas holders and a coal yard. If the bidders for the gas holders on this section of the former block did not completely remove the foundations, it is likely they may still be extant below parts of the roads, although reconstruction of Route 9A and installation of various utilities may have destroyed some of these resources.

Block 689 (bounded by West 17th and West 18th Streets, 10th and 11th Avenues)

The remaining MGP site footprint on this block not truncated by roadway reconfiguration consists of Tax Lot 17, which encompasses the entire modern block. After the MGP closed, a number of the buildings on the block were reused for other purposes. The structures along West 17th Street were occupied by a "Wood Pulp Doll Factory," lumber storage, and a cooperage. Along 10th Avenue, the former purifying house was used by the United Electric Light and Power Company for cable and pipe storage. On West 18th Street, the old gas company laboratory was a "Packing Box Factory" and a foundry, while in the center of the block, the former condenser house was used to store boxes (Sanborn, 1921). Wastes associated with the foundry would be similar to some of the MGP wastes and would likely include ash, cinders, and metals. Wastes associated with the other operations could include wood, paint, wood pulp, and metals.

After the New York Central Railroad acquired the block in 1932, these structures were all demolished, and a railroad yard was built in their place. Wastes associated with the rail yard would include petroleum products and anything that was contained within the train cars that was spilled. Later, the railroad tracks were covered over by asphalt, and the block was used as an automobile parking lot. From the mid-1950s through the 1980s, a gas station and garage existed on the southwest corner of the block. Today, the block is used strictly for parking, with an overhead railroad viaduct crossing overhead.

As with Block 688 to the south, the western end of original Block 689 now lies under 11th Avenue, Marginal Street, or the Hudson River. Portions of the former MGP under this area include the retort house and the coal house. Remaining remnants of these buildings were not observed but may exist in the subsurface below 11th Avenue and Marginal Street.

Block 690 (bounded by West 18th and West 19th Streets, 10th and 11th Avenues)

After roadway reconfiguration, the former MGP site footprint on Block 690 consisted of Tax Lots 12, part of 20, 29, part of 40, 42, and 54. Tax Lots 12, 20, 40, 42, and 54 overlay the gas company's former coal yard, pipe yard, and (later) store yard, while Tax Lot 29 overlays the former gas holders and several ancillary structures. Some of the lots were used as wagon yards (Tax Lots 12, 29) after initial sale by the gas company. Tax Lot 29 later became an automobile parking lot, and last, a truck parking lot. Two structures stand along the southern part of Tax Lot 29, and are now used as offices. Additional areas on the block had automobile garages built on them, some with basements (Tax Lots 12, 20, and 46 [not part of the gas company holdings, but surrounded by it]). The remaining lots on the block were developed with warehouse-type structures (Tax Lots 40 and 42) and a small hotel (Tax Lot 54). Buried gasoline tanks are known to exist or have once existed on Tax Lots 12, 20, 29, and possibly 40. These operations with tanks could have leaked petroleum products. Block 690 also has an overhead railroad viaduct crossing its eastern end, from West 18th Street to West 19th Street.

As with the blocks to the south, the western end of original Block 690 now lies under 11th Avenue and Marginal Street. However, most of the land that was condemned was not owned by the gas company (the exception was a part of Lot 12 that had been used as a coal yard).

Block 691 (bounded by West 19th and West 20th Streets, 10th and 11th Avenues)

Tax Lots 1 and 11 are the only portions of Block 691 formerly owned by the gas company. They once contained two gas holders and several ancillary structures; the third and largest gas holder on the block was demolished prior to pier extension and road configuration. After sale of the lots by the gas company, they were used as a "house wrecker's yard" (Tax Lot 1) and a wagon yard (Tax Lot 11). In the 1920s, a building occupied by the American Red Cross was located across the two modern tax lots, along the 11th Avenue frontage of the block. By 1930, this building had been razed and a YMCA building (eight stories with a basement) had been constructed on Tax Lot 1, which still stands in its original location. Tax Lot 11 has been used as an automobile parking lot since the 1930s. The former YMCA building on Tax Lot 1 has a basement, and the building application on file at the Department of Buildings indicated the foundations (concrete-filled casings) would be excavated to hard rock. It is likely little if any remains of the gas holders still exist on this lot. Wastes and contamination from the YMCA and American Red Cross would be limited to trash and refuse disposed off-site. However, since Tax Lot 11 has been used primarily as a surface parking lot, it is possible the foundations of the gas holders still may be located beneath the current ground surface. Likewise, for the former area of Block 691 now under 11th Avenue and Marginal Street, portions of the large gas holders' foundation still may be extant, as Department of Docks and Ferries documents indicate that bidders wishing to purchase the gas holder only had to remove the structure down to the top of its foundations (at approximately 5 feet below grade). The remaining extent of the foundation was not necessarily removed at this time.

Block 715 (bounded by West 17th and West 18th Streets, 9th and 10th Avenues)

The portion of Block 715 once owned by the gas company is restricted to Tax Lot 59, along West 18th Street. This lot contains a garage, but is the same structure built to cover the gas holders, albeit with interior modifications. Subsurface foundation remnants of the gas holders could survive under the garage floor. Wastes associated with the garage operation would include petroleum products.

Former Block 666 (bounded by West 16th and West 19th Streets, 11th and 13th Avenues)

Before inland pier extension, the southern and central thirds of old Block 666 belonged to the gas company. Today, only a section of the center third, formerly used as a coal yard and later a store yard, is not under water. The footprint of Pier 59 overlaps this area, and likely has destroyed the former ground surface during construction of the pier, and later rebuilding of the pier in the 1960s (AKRF et al., 1993). The Chelsea Piers project is an 18.86 acre project that includes Piers 59, 60, 61, and 62. The sports and entertainment complex includes television and movie studios, golf driving range, track and gymnastics centers, two Olympic-size ice skating rinks, three restaurants, parking, retail space, a small boat marina, and excursion boating. Wastes generated from the site may include petroleum or sewage discharges or leaks from pleasure boats and excursion boats and general refuse from the other operations.

11th Avenue/Marginal Street (between West 16th and West 20th Streets)

The current alignment of 11th Avenue and Marginal Street overlies the former western ends of Blocks 688, 689, 690, and 691. The roads were laid out in the early 1900s, at the same time the piers were extended inland. From the 1930s to the 1970s, this roadway also supported the elevated Miller Highway (Hartgen, 1994). Today this area supports multiple-lane, at-grade roadways separated by a wide median strip. AKRF, Inc. conducted drilling and sampling along the Route 9A reconstruction corridor. Results for the segment near the former West 18th Street MGP are presented in Section 7.2.

6.5 SUMMARY OF OPERATIONAL HISTORY

Tables 6.1 through 6.10 present a summary of the progression of the significant operations conducted on each of the tax lots that comprised the former West 18th Street MGP. Details of the operations and historical progression have been presented in Sections 6.1 through 6.4.

Table 6.1

Block 688 Tax Lot 1001/1002

Year	Usage	Owner	Comments
Pre-MGP	Houses, stone yard, whiting factory, wagon factory, wood yard	Various	Factories and wood yard existed in 1850s and 1860s.
1858-1900s	Gas holders, coal yards	Manhattan Gas Light Co. then Consolidated Gas Co. of NY	
1917-Present	Warehousing and condominiums	First owner Merchant's Refrigerating Co., current owner Able Empire Group LP and Tenth Avenue MS Properties	Currently contains condos and a Mini Storage. Building has 10 stories and a basement.

Table 6.2

Block 689 Tax Lot 17

Year	Usage	Owner	Comments
Pre-MGP	Under water	Various	Eastern end of block filled in early 1830s.
1833-1900s	MGP	Manhattan Gas Light Co. then Consolidated Gas Co. of NY	Main structures were retort house, condensers, scrubbers, purifying house, laboratories and shops.
1917-1932	Wood Pulp Doll Factory, lumber storage, cooperage, cable and pipe storage, packing box factory, box storage, foundry	New York State Realty and Terminal Co.	Reuse of old gas company buildings.
1932-1960	Railroad yard, later parking lot, automobile service station and garage	New York Central Railroad Co.	
1960-present	Parking lot	Various corporations	Gas station removed in 1980s.

Table 6.3

Block 690 Tax Lot 12

Year	Usage	Owner	Comments
Pre-MGP	Steam Mill, paint factory	William Hockman	Steam mill shows on historical maps in 1852, paint factory in 1859.
1860s-1900s	Gas company coal yard, wagon yard	Manhattan Gas Light Co. then Consolidated Gas Co. of NY	
1922-Present	Garage	First owner Ambro Stores and Garage Corp. (current owner Cotard Realty Associates)	Multiple stories with a basement.

Table 6.4

Block 690 Tax Lot 20

Year	Usage	Owner	Comments
Pre-MGP	Steam Mill, Distillery and Manufactory of Compressed Yeast complex, later Rectifying Distillery	William Hockman	Steam mill shows on historical maps beginning 1852, other factories by 1859.
1870s-1900s	Gas company coal yard, pipe yard, store yard	Manhattan Gas Light Co. then Consolidated Gas Co. of NY	
1919-Present	Garages	Various (current owner Cotard Realty Associates)	Garage on W. 18th St. built 1919, smaller garage on W. 19th St. built 1947.

Table 6.5

Block 690 Tax Lot 29

Year	Usage	Owner	Comments
Pre-MGP	Undeveloped	William and Marianna Power	
1848-1914	Gas holders	Manhattan Gas Light Co. then Consolidated Gas Co. of NY	
1917-Present	Wagon yard, automobile parking lot, truck parking lot, two small offices	Various (current owner Cotard Realty Associates)	Lot has had underground gasoline tanks.

Table 6.6

Block 690 Tax Lot 40

Year	Usage	Owner	Comments
Pre-MGP	Shop, later automobile repair facility	Estate of William Hockman and others	West half of modern lot, building not razed until 1920s.
Pre-MGP	Undeveloped	Estate of William Hockman	East half of modern lot.
1870-1900s	Gas company pipe yard	Manhattan Gas Light Co. then Consolidated Gas Co. of NY.	East half of modern lot.
1900s-1923	Vacant	Consolidated Gas Co. of NY	East half of modern lot.
1923-1969	Ice storage warehouse	Huntoon Ice Company	East and west halves joined.
1969-present	Movie studio	Eli Studios and others	Retrofitted ice storage warehouse.

Table 6.7

Block 690 Tax Lot 42

Year	Usage	Owner	Comments
Pre-MGP	Distillery and Manufactory of Compressed Yeast complex, later Rectifying Distillery.	Estate of William Hockman and others	Factories shown on 1859 and 1869 historic maps
1870-1900s	Gas company coal yard, store yard.	Manhattan Gas Light Co. then Consolidated Gas Co. of NY.	
1900s-1922	Vacant	Consolidated Gas Co. of NY	
1922-present	Ice company warehouse, spring water warehouse.	Huntoon Ice Company and others.	

Table 6.8

Block 691 Tax Lot 1

Year	Usage	Owner	Comments
Pre-MGP	Undeveloped	Estate of Clement Moore	Lot under water through 1850s.
1866-1900s	Gas holders, coal yard	Manhattan Gas Light Co. then Consolidated Gas Co. of NY.	Two gas holders built after 1866, third built in early 1890s.
1900s-1930	American Red Cross building, small office building, "house wrecker's yard".	Consolidated Gas Co. of NY and others.	
1930-present	Office building (originally YMCA).	YMCA and others (current owner New York State Urban Development Corp.).	

Table 6.9

Block 691 Tax Lot 11

Year	Usage	Owner	Comments
Pre-MGP	Undeveloped	Estate of Clement Moore	Lot under water through 1850s.
1866-1900s	Gas holders, coal yard.	Manhattan Gas Light Co. then Consolidated Gas Co. of NY.	Two gas holders built after 1866, third built in early 1890s.
1900s-1930	American Red Cross building, wagon yard.	Consolidated Gas Co. of NY and others.	
1930-present	Parking lot	Various (current owner Heller et al.)	

Table 6.10

Block 715 Tax Lot 59

Year	Usage	Owner	Comments
Pre-MGP	Undeveloped	Samuel Turner	
1845-1914	Gas holders in covered warehouse.	Manhattan Gas Light Co. then Consolidated Gas Co. of NY.	
1915-present	Garage	Consolidated Gas Co. of NY and others (current owner Retaco Holding Corp.).	Former gas holder building retrofitted; Con Ed sold property in 1944.

SECTION 7

ENVIRONMENTAL/REGULATORY AGENCIES AND DATABASES

7.1 EDR PROFILE SEARCH

A search of site environmental databases was conducted by EDR on March 12, 2002. The search included New York State and Federal databases. The complete listing of sites is presented in the EDR report in Appendix B. All sites identified in the EDR search report are at equal or higher elevation than the 18th Street site.

Mappable Sites

Mappable sites in the vicinity of the 18th Street site were identified on the area map provided in the EDR profile search. A list of acronyms and definitions are included in the database search report in Appendix B. The following is a summary of the findings:

The database search identified nine large quantity and 15 small quantity sites where hazardous wastes are generated, transported, stored, treated, and/or disposed within 0.25 miles of the site. Fifty-three leaking tanks and 29 USTs were identified within 0.5 and 0.25 miles of the site, respectively. One chemical bulk storage AST was 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.

The EDR Proprietary Historical Database revealed one coal gas site owned by Consolidated Gas Company at 450 W 18th Street. The site was a gas holder and is located on the south side of W. 18th Street between Tenth Avenue and Ninth Avenue. This site is on Block 715 and has been included in the historical research presented in this report.

Table 7.1

Summary of Environmental Database Findings (Mappable Sites)

Jurisdiction	Program Database	Radius (Miles)	Number of Sites
Federal	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	9
	RCRIS (Small Gen.) – RCRIS Small Quantity Generator	0.25	15
Federal Supplemental	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
State	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	53
	UST – Underground Storage Tank Database	0.25	29
	CBS UST – Underground Chemical Bulk Storage Tank	0.25	0
	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
State/Local Supplemental	HSWDS – Hazardous Substance Waste Disposal Site Inventory	0.5	0
	CBS AST – Above-ground Chemical Bulk Storage Tank	0.25	1
	MOSF AST – Major Oil Storage Facilities Database	0.5	0
EDR Proprietary	Coal Gas – Manufactured Gas (Coal Gas) Site	1	1

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 upmappable sites are provided in the EDR Search Report in Appendix B and are summarized in Table 7.2.

Table 7.2 Summary of Environmental Data Base Findings (Unmappable Sites)

Jurisdiction	Program Database	Number of Sites
Federal	SHWS, FINDS, RCRIS-LQG, MLTS	1
	RCRIS-SQG, FINDS	1
State	LTANKS	4
	UST	3

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 the West 18th Street MGP was sampled by AKRF, Inc. as part of the Route 9A reconstruction project (AKRF et al, 1994). Six test borings were drilled between the former MGP and the Hudson River and piers, three during Phase 1A and three during Phase 1B. One monitoring well was installed two blocks south of the former MGP and one well was installed approximately two blocks north of the former MGP during Phase 1A. A site map is included in Appendix C. Analytical results for samples collected in the vicinity of the former MGP found:

- Leachable lead was found in H-27 at 26 mg/kg but below the EP Toxicity lead level.
- Heavy metals were detected in most samples but below EP Toxicity levels.
- PAHs were detected in most samples.
- BTEX at 132 mg/L, PAHs at 63 mg/L and many metals were detected two blocks south of the site in W-25. The elevated levels of PAHs and metals were attributed to high turbidity in the samples.
- VOCs were detected in B-14 from 8 to 12 feet at 0.4 mg/kg.
- PAHs were detected in subsurface samples from B-14 at (88 mg/kg, 85 mg/kg, and 19 mg/kg).
- TPH was detected in BH-16 at a relatively low concentration.

- Cyanide was detected at 1.1 mg/kg in surface sample BH-14 collected west of 18th Street.
- Groundwater from BW-13, located mid-block along West 16th Street, contained 1 mg/L of BTEX, 0.063 mg/L of PAHs and had a strong "petroleum" odor. However, the sample was turbid.

MTA performed a Phase I and Limited Phase II environmental site investigation in 1998 on Block 689 (MTA, 1998b and MTA, 1998c), AKRF prepared a summary document, *Soil Sample Summary and Result for Soil Safe Criteria* in April 1999 (AKRF, 1999), and Blasland, Bouck and Lee, Inc (BB&L) prepared a remediation Work Plan in November, 1999 (BB&L, 1999). Composite samples from two depth intervals (0 to 8 feet and 8 to 20 feet) were analyzed during the MTA Phase II investigation. A site map showing sample locations is included in Appendix C. Sampling results are summarized below:

- A UST was identified at the boring B-14 location.
- VOCs and PAHs were detected in soils across the site.
- VOCs from 0 to 8 feet did not exceed NYSDEC Soil Cleanup Criteria.
- One PAH sample from 0 to 8 feet exceeded the NYSDEC Soil Cleanup Criteria of 500 mg/kg (boring pair B-1 and B-10 located on the western end of Block 689).
- Total VOC concentrations exceeded the NYSDEC Soil Cleanup Criteria of 10 mg/kg in samples collected from 8 to 20 feet in seven boring pairs. The borings were primarily located in the central and western portions of Block 689 in boring pairs B-1 and B-10, B-2 and B-11, B-3 and B-12, B-5 and B-14, B-6 and B-15, B-7 and B-16, B-9 and B-18.
- Total PAHs were detected at concentrations exceeding the NYSDEC Soil Cleanup Criteria of 500 mg/kg in three composite samples collected from between 8 and 20 feet in boring pairs B-5 and B-14, B-1 and B-10, and B-3 and B-12 located in the central and western portions of Block 689.
- Worldwide Geosciences, Inc. performed an interpretive characterization of TPH results from 71 samples collected on the eastern portion of Block 689 to finger print the source materials comprising the samples. The conclusion was that 56 of the 58 interpretable chromatograms were indicative of coal tar or MGP residues.
- BTEX and PAHs were detected in all three groundwater samples collected on Block 689. The highest BTEX and PAH concentrations exceeded NYSDEC Class GA groundwater standards in MW-2 located near the northwest corner of Block 689. Benzene and naphthalene exceeded the standards in MW-3 located at the eastern end of the site, and only benzene exceeded the standards in MW-1 located near the southwest corner of the Block.

SECTION 8

POTENTIAL RECEPTORS

8.1 SENSITIVE AREAS

Based upon the site reconnaissance conducted on May 15, 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	General Theological Seminary between W. 20th and W. 21st St. and 10th and 9th Ave.
	<0.25	Bayard Rustin High School for Humanities Humanities Preparatory Academy between W. 19th and W. 18th St. and 8th and 9th Ave.
	0.25	IS/JHS 414 and IS/JHS 899 between W. 17th and 18th St. and 8th and 9th Ave.
	0.25	PS 011 between 20th and 21st St. and 8th and 9th Ave.
Day Care Facilities		NA
Parks		NA
Libraries or Community Organizations		NA
Tourist Attractions	<0.25	Chelsea Piers Sports/Entertainment Complex
Sensitive Receptors/Habitats		
Waterbodies	<0.25	Hudson River
Wetlands	<0.25	The EDR report identifies wetlands adjacent to the piers in the Hudson River.
Surrounding Land Use		
Residential Only	NA	
Mixed Residential and Commercial/Industrial	<0.25	High-rise housing, brownstone-type apartment buildings and commercial usage. 1,155 residents in Census Tract 99 and 3,477 and 5,320 people in adjacent Census Tracts 83 and 89 (Census 2000).
Commercial/Industrial Only	NA	

Table 8.2 Potential Exposure Pathways

Pathway	Possible Exposure Yes/No	Comments
Soils		
Exposed Ground Surface	No	Surfaces are paved or occupied by buildings.
Subsurface	Yes	Sampling in Block 689 identified the presence of residues in the subsurface that may represent an exposure pathway to excavators and intrusive work. Similar conditions may exist on the other Blocks formerly occupied by the MGP.
Seeps/Vapors	Yes	Buildings have basements. Residues, if present, could seep into basements along with shallow groundwater, or as vapors.
Surface Water	**Miles**	**Comments**
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	<0.25 miles	The EDR report shows wetlands adjacent to the piers east of the site.
Contaminated Runoff Potential	No	The site is paved and occupied with buildings. Contaminated runoff could occur during excavation if excavated soils are uncovered and runoff is not controlled.
Groundwater		
Groundwater Used for Drinking in Manhattan?	No	The area is in the NYC water supply area supplied by upstate reservoirs. Groundwater is 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. There are no potential impacts from the West 18th Street site because of the separation by the East River and a groundwater divide. The EDR report identifies a public water system at 424 West 51st Street. This is the address of the supply owner. The actual supply is located upstate in Liberty, NY.
Depth to Aquifer Used for Drinking	NA	No drinking water aquifers used in site vicinity.

SECTION 9

DISCUSSION AND CONCLUSIONS

9.1 DISCUSSION

The following conclusions are based on the historical research and site reconnaissance visit to the former West 18th Street MGP:

- Industrial activities were conducted in the vicinity of the former West 18th Street MGP prior to the construction of the MGP. Industries identified included a steam mill, paint factory, whiting factory, wagon factory, distillery and "manufactory" of compressed yeast, and rectifying distillery.
- The former West 18th Street MGP operated from 1834 through the early 1900s. The gas plant was located on Block 689, and gas holders and storage yards were located on Blocks 688 and 690 and portions of Blocks 691, 666, and 715. Production of coal gas began at the site in 1834 by the Manhattan Gas Light Company and was continued by the Consolidated Gas Company, formed in 1884. The MGP continued to produce gas from coal until the early 1900s. Large-scale operations were discontinued in 1902-1903 when the City of New York obtained the western portions of Blocks 688, 689, 690, and 691 for the reconfiguration of 11th Avenue and the inland extension of the piers. Con Edison continued to use the buildings on Block 689 several years longer for distribution, shops, and experimental activities. Those gas holders that were not demolished for road reconfiguration continued to be used: the holders on Block 691 were taken out of service in 1909 and the holders on Blocks 690 and 715 were shut down in 1914. Some of the site structures on Block 689 were used by other tenants through the 1920s, but appear to have been demolished in the 1930s.
- Various lots from the former MGP were sold beginning in 1915 and new structures were built on portions of the site after the MGP structures were razed. The disposition of the materials from the razed structures is not documented. Some gas holders were offered for sale.
- With the exception of Block 715, which was always on solid ground, the entire West 18th Street MGP is located on landfill material. The nature and source of the fill material is unknown. Some of the fill was later excavated for the inland expansion of the piers. The disposition of the excavated material is unknown.
- The disposition of wastes and byproducts generated by the former MGP is not well documented.
- Based on the site reconnaissance and historical research, one structure associated with the former MGP remains. This building is a warehouse that formerly housed two gas holders on Lot 59 on Block 715.
- Areas of the site that have not had significant excavation and redevelopment may retain remnants of the former MGP structures and may contain possible MGP residuals below

the ground surface as found on Block 689 during subsurface investigation for a proposed FedEx facility.

- The area of the former West 18th Street MGP is a mixed use area with commercial properties including art galleries, office space, warehousing, trucking, parking lots, the Roxy night club, and high-rise and brownstone apartments. Schools are located within 0.25 miles of the site. The Chelsea Piers recreational facility is just west of the site.
- The EDR report indicates the potential exists for spills and leaks from other sources within the area. The report identified 15 RCRIS small quantity generators and nine large quantity generators within 0.25 miles of the site. In addition, there are 29 USTs and one bulk chemical storage tank within 0.25 miles and 53 leaking tanks within 0.5 miles of the former West 18th Street MGP.
- Soil sampling on Block 689 conducted by MTA in 1998 identified TPH, VOCs, PAHs in soils and/or groundwater above NYSDEC soil or groundwater criteria (MTA, 1998c).
- Sampling by AKRF for the Route 9A reconstruction project identified lead, PAHs, BTEX, and cyanide in samples collected near the former MGP (AKRF, 1994).
- If impacts are present at the site, potential receptors would include workers, nearby residents, and tourists visiting the area. Most of the former site is covered with pavement and buildings. Therefore, no exposure pathways for surface and subsurface soil are present. Workers conducting excavation or intrusive construction activities could encounter residues from past operations. There is no groundwater usage so the groundwater pathway is not complete. The EDR report shows a public water supply system site at 424 West 51 St. Street. However this is not the location of a well or production facility, it is the address of the owner of an upstate water supply located in Liberty, New York.
- The Hudson River is within 0.25 miles of the former MGP and could be impacted if MGP residuals are migrating from the site or if past disposal practices included 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 do 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

10.1 PRIORITIZATION SUMMARY AND CONCLUSIONS

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 18th Street MGP, a former MGP located in the Chelsea section of Manhattan. Table 10.1 presents a summary of factors that will be used in the prioritization.

Table 10.1 Prioritization Criteria and Factors

Prioritization Criteria	Prioritization Factors
Does Con Edison own and control access and site usage?	Con Edison does not own or control access or site usage.
Relative size of the former MGP.	The former MGP site was approximately 17 acres and occupied all of Blocks 688, 689, 690, and portions of Blocks 691, 715, and former Block 666. The remaining MGP area is approximately 7.5 acres. The rest is under Marginal Street, 11th Ave. or was reclaimed for inland pier extension.
Potential for development.	The area has potential for development. Block 689 has been evaluated for a new multistory FedEx facility. The Chelsea Piers recreational complex was built west of and over the former MGP on Block 662. Much of the remaining former MGP consists of older buildings that could be replaced.
Current potential for direct exposure to impacted soils.	The former MGP 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 nine RCRIS large quantity generators, 15 RCRIS small quantity generators, 29 UST sites, and one bulk chemical storage tank within 0.25 miles of the former MGP and 53 leaking storage tank sites within 0.5 miles.

Table 10.1 Prioritization Criteria and Factors (Continued)

Prioritization Criteria	Prioritization Factors	
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	1,155 residents in Census Tract 99 (includes the site) and 3,477 and 5,320 people in adjacent Census Tracts 83 and 89 and 1,537,195 people in Manhattan Borough (Census, 2000).
	Playgrounds/Parks	None identified nearby.
	Schools	General Theological Seminary between W. 20th and W. 21st St. and 10th and 9th Ave. Bayard Rustin High School for Humanities Humanities Preparatory Academy between W. 19th and W. 18th St. and 8th and 9th Ave. IS/JHS 414 and IS/JHS 899 between W. 17th and 18th St. and 8th and 9th Ave. PS 011 between 20th and 21st St. and 8th and 9th Ave.
	Residences	There are 401 residential units near the site (high-rise and brownstone apartments) in Census Tract 99 and 5089 housing units in the two adjacent Census Tracts (83 and 89).
	Gardens	None
Physical Site Factors	Wetlands	The EDR report identifies wetlands adjacent to the piers on the Hudson River less than 0.25 miles to the west.
	Topography	The site topography is gently sloping to the west with an elevation change of approximately 4 feet from east to west.
	Soil Types and Permeability	The soils are likely fill and urban soils with relatively high permeabilities. The site is covered limiting access and infiltration.
	Cover	The site is paved or covered with buildings.

Table 10.1 Prioritization Criteria and Factors (Continued)

Prioritization Criteria	Prioritization Factors	
Physical Site Factors (continued)	Depth to Groundwater	Approximately 6 to 11 feet based on data from limited site investigation results.
	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.	Most of the surrounding buildings appear to have basements. The potential for seepage/volatilization into basements exists if impacted soils are present. Verification of the types of ventilation systems used was not possible.	
Ongoing or obvious impacts to surface water.	None observed during 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., Philip Habib & Associates, and EEA, Inc. (AKRF et al.), 1993. *Chelsea Piers, New York, New York, Final Environmental Impact Statement*. Prepared for New York State Department of Transportation, Albany, New York.

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

Allee, King, Rosen, & Fleming, Inc., (AKRF) 1999. Federal Express Site, 10th Avenue between West 17th and West 18th Streets, Soil Sample Summary and Results for Soil Safe Criteria prepared for Edison Properties, Newark, NJ. April 1999.

Alrich, Herbert W., 1934. Gas Tanks Now & Then. *American Gas Journal* 140(5): 75-78, 148.

Assessed Valuation of Real Estate, 1836-42, On file at the Municipal Archives of the City of New York.

Assessed Valuation of Real Estate, 1857. On file at the Municipal Archives of the City of New York.

Blasland Bouck and Lee, Inc. (BB&L), 1999. Remediation Work Plan, Proposed Federal Express Distribution Center, Borough of Manhattan, New York, NY, November 1999.

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

Census, 2000. United States Census Data 2000. Website Http://factfinder.census.gov.

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, 1915. Bin #1012278.

Department of Docks and Ferries (within Department of Port and Trade collection), 1903-1905. Filemaps N-276, Box 2. Chelsea Section, Maps to Accompany Sale of Buildings. On file at the Municipal Archives of the City of New York.

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.

Edison Electric Institute (EEI), 1984. *Handbook on Manufactured Gas Plant Sites*. Prepared for the Utility Solid Waste Activities Group Superfund Committee, Washington, D.C., ERT Project No. P-D215.

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.

Harper's New Monthly Magazine, December 1862. pp. 14-28, "Gas and Gas Making."

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.

Hornby, John, 1911. *A Text-Book of Gas Manufacture For Students*, Sixth Edition. G. Bell and Sons, Ltd., London.

Melick-Tully and Assoc., P.C., (MTA), 1998a. Report, Geotechnical Engineering Investigation, Proposed Federal Express Distribution Center, Borough of Manhattan, New York City, NY, Edison Properties, LLC., July 1998.

Melick-Tully and Assoc., P.C., (MTA), 1998b. Limited Phase II Environmental Site Investigation Report, Proposed Federal Express Distribution Center, Borough of Manhattan, New York City, NY, Edison Properties, LLC., July 1998.

Melick-Tully and Assoc., P.C., (MTA), 1998c. Limited Phase II Environmental Site Investigation Report, Proposed Federal Express Distribution Center, Borough of Manhattan, New York City, NY, Edison Properties, LLC., July 1998.

Perris and Company, 1859. *Insurance maps of the City of New York*. Perris and Browne, New York.

Perris and Browne, 1869. *Insurance maps of the City of New York*. Perris and Browne, New York.

Perris and Browne, 1874. *Insurance maps of the City of New York*. Perris and Browne, New York.

Perris and Browne, 1887. *Insurance maps of the City of New York*. Perris and Browne, New York.

Public Service Commission (PSC), 1907-1914. *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, 1895. *Insurance Maps of the City of New York.* Sanborn Map Company, New York.

Sanborn Map Company, 1904. *Insurance Maps of the City of New York.* Sanborn Map Company, New York.

Sanborn Map Company, 1921. *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, 1969. *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, 1985. *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.

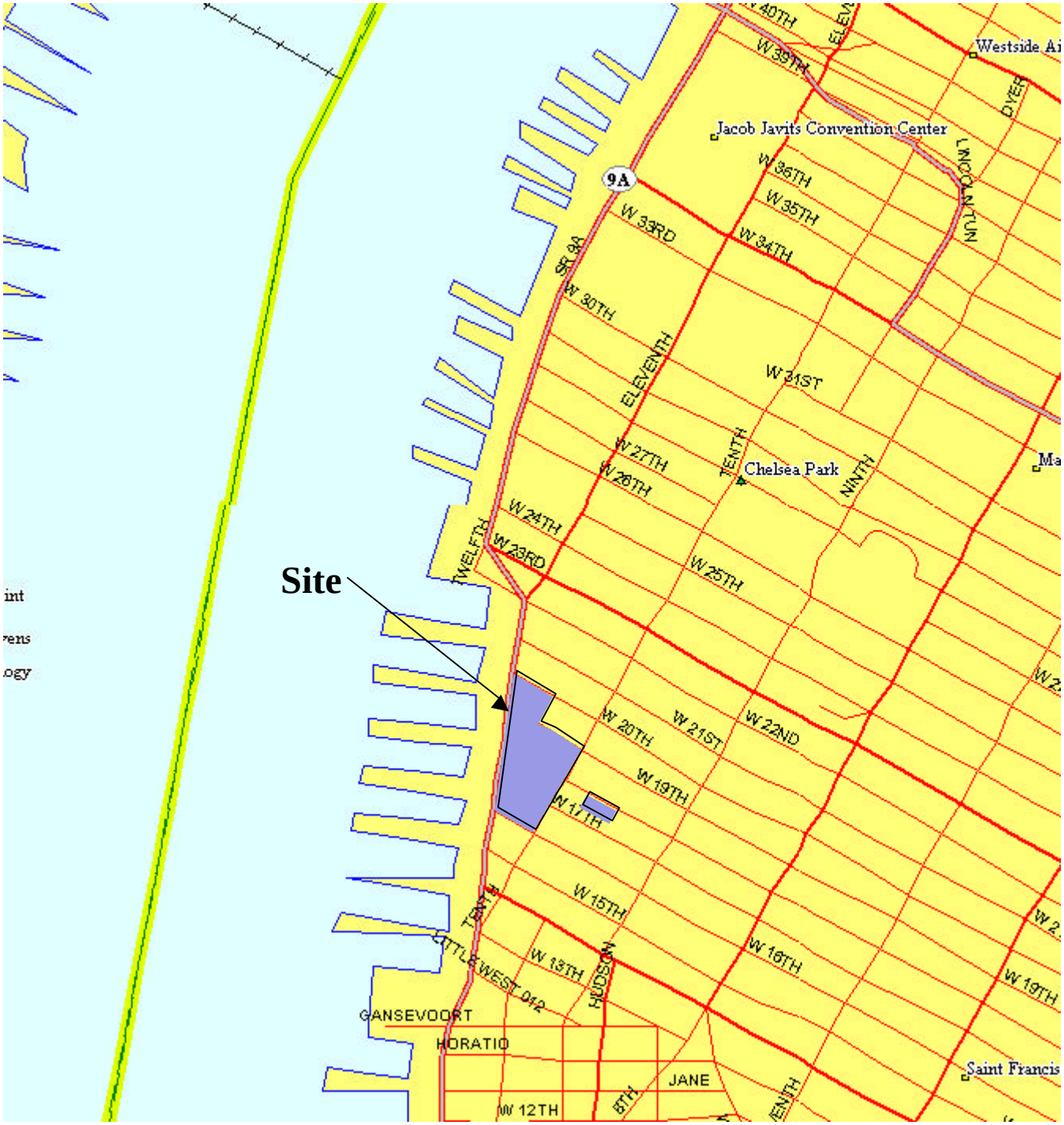
Stewart, E.G., 1958. *Town Gas, Its Manufacture and Distribution.* Her Majesty's Stationery Office, London.

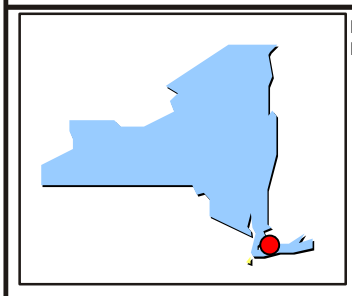
Taylor, Will, 1879. *The City of New York*. Galt and Hoy, New York. On file at the Library of Congress American Memory website http://memory.loc.gov/.

Viele, Egbert L., 1865. *Sanitary and Topographical Map of the City and Island of New York*. Mayer and Company, New York.

World Geosciences, Inc., 2000. Interpretive Characterization of Analytical Results , Former Consolidated Edison MGP Site, Manhattan, NY, prepared for Edison Properties, October 2000.

FIGURES





New York Quadrangle

LATITUDE: N40° 45'' 41"
LONGITUDE: W73° 59' 58"

N

0.200 MI

Figure 1

CONSOLIDATED EDISON

NEW YORK, NEW YORK

SITE LOCATION MAP
FORMER WEST 18th STREET GAS WORKS

PARSONS

DESIGN * RESEARCH * PLANNING

290 Elwood Davis Road, Suite 312, Liverpool, New York 13088 * (315) 451-9560

Offices in Principal Cities

P:\741280\CAD\18th\SITELOC.PPT

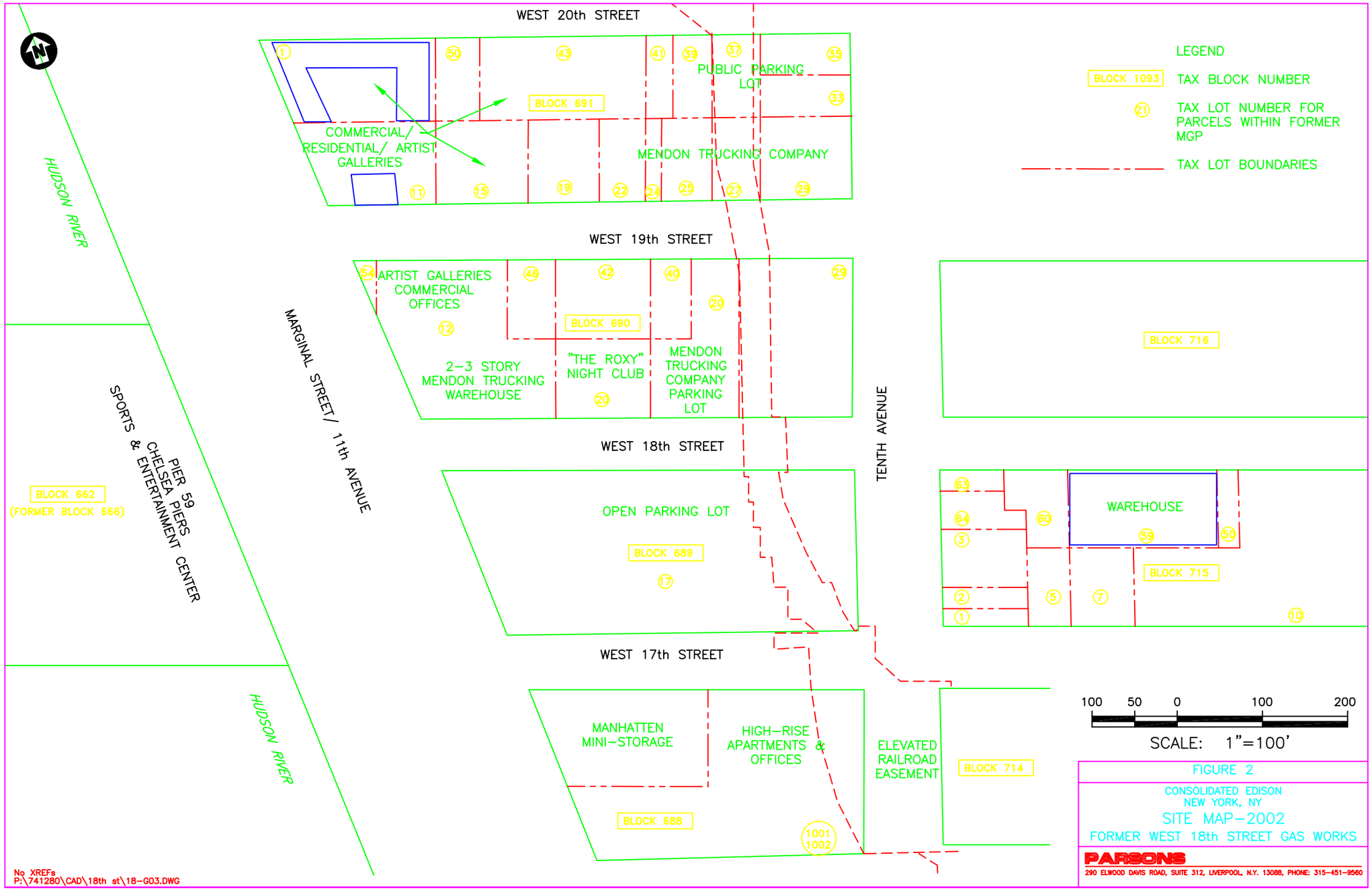


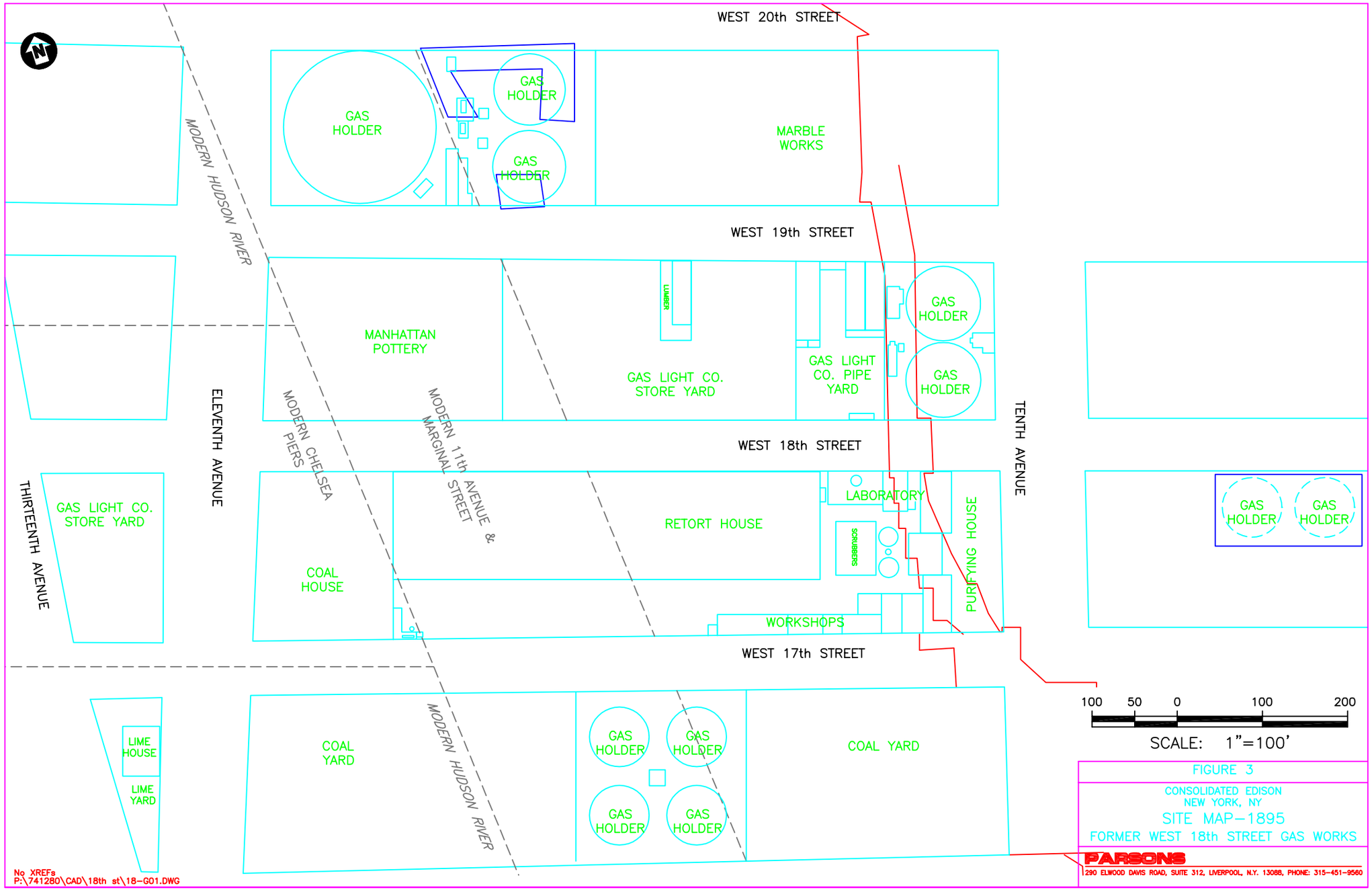
FIGURE 2

CONSOLIDATED EDISON
NEW YORK, NY

SITE MAP-2002

FORMER WEST 18th STREET GAS WORKS

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


WEST 20th STREET
GAS HOLDER
GAS HOLDER
GAS HOLDER
MARBLE WORKS
MODERN HUDSON RIVER
WEST 19th STREET
MANHATTAN POTTERY
LUMBER
GAS LIGHT CO. STORE YARD
GAS LIGHT CO. PIPE YARD
GAS HOLDER
GAS HOLDER
TENTH AVENUE
ELEVENTH AVENUE
MODERN CHELSEA PIERS
MODERN 11th AVENUE & MARGINAL STREET
WEST 18th STREET
THIRTEENTH AVENUE
GAS LIGHT CO. STORE YARD
COAL HOUSE
RETORT HOUSE
LABORATORY
SCRUBBERS
PURIFYING HOUSE
GAS HOLDER
GAS HOLDER
WORKSHOPS
WEST 17th STREET
LIME HOUSE
LIME YARD
COAL YARD
MODERN HUDSON RIVER
GAS HOLDER
GAS HOLDER
GAS HOLDER
GAS HOLDER
COAL YARD
100 50 0 100 200
SCALE: 1"=100'
FIGURE 3
CONSOLIDATED EDISON
NEW YORK, NY
SITE MAP–1895
FORMER WEST 18th STREET GAS WORKS
PARSONS
290 ELWOOD DAVIS ROAD, SUITE 312, LIVERPOOL, N.Y. 13088, PHONE: 315–451–9560
No XREFs
P:\741280\CAD\18th st\18–G01.DWG

WEST 20th STREET

WEST 19th STREET

WEST 18th STREET

WEST 17th STREET

HUDSON RIVER

MARGINAL STREET

11th AVENUE

TENTH AVENUE

GAS HOLDER

COMMERCIAL / RESIDENTIAL / ARTIST GALLERIES

BLOCK 691

MARBLE WORKS

PUBLIC PARKING LOT

MENDON TRUCKING COMPANY

ARTIST GALLERIES COMMERCIAL OFFICES

BLOCK 690

2–3 STORY MENDON TRUCKING WAREHOUSE

GAS LIGHT CO. STORE YARD

"THE ROXY" NIGHT CLUB

PIPE YARD MENDON TRUCKING COMPANY PARKING LOT

MANHATTAN POTTERY

BLOCK 662 (FORMER BLOCK 666)

PIER 59 CHELSEA PIERS & ENTERTAINMENT CENTER

COAL HOUSE

LABORATORY

OPEN PARKING LOT

RETORT HOUSE

BLOCK 689

SCRUBBERS

PURIFYING HOUSE

WORKSHOPS

LIME HOUSE

LIME YARD

COAL YARD

MANHATTEN MINI–STORAGE

HIGH–RISE APARTMENTS & OFFICES

ELEVATED RAILROAD EASEMENT

BLOCK 688

BLOCK 714

BLOCK 716

BLOCK 715

WAREHOUSE

LEGEND

BLOCK 1093 TAX BLOCK NUMBER

21 TAX LOT NUMBER FOR PARCELS WITHIN FORMER MGP

TAX LOT BOUNDARIES

HISTORICAL FEATURES

80 40 0 80 160

SCALE: 1"=80'

No XREFs
P:\741280\CAD\18th st\18–G04.DWG

FIGURE 3A

CONSOLIDATED EDISON
NEW YORK, NY

HISTORICAL AND CURRENT SITE FEATURES
FORMER WEST 18th STREET GAS WORKS

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

Figure 4: 1865 Viele map

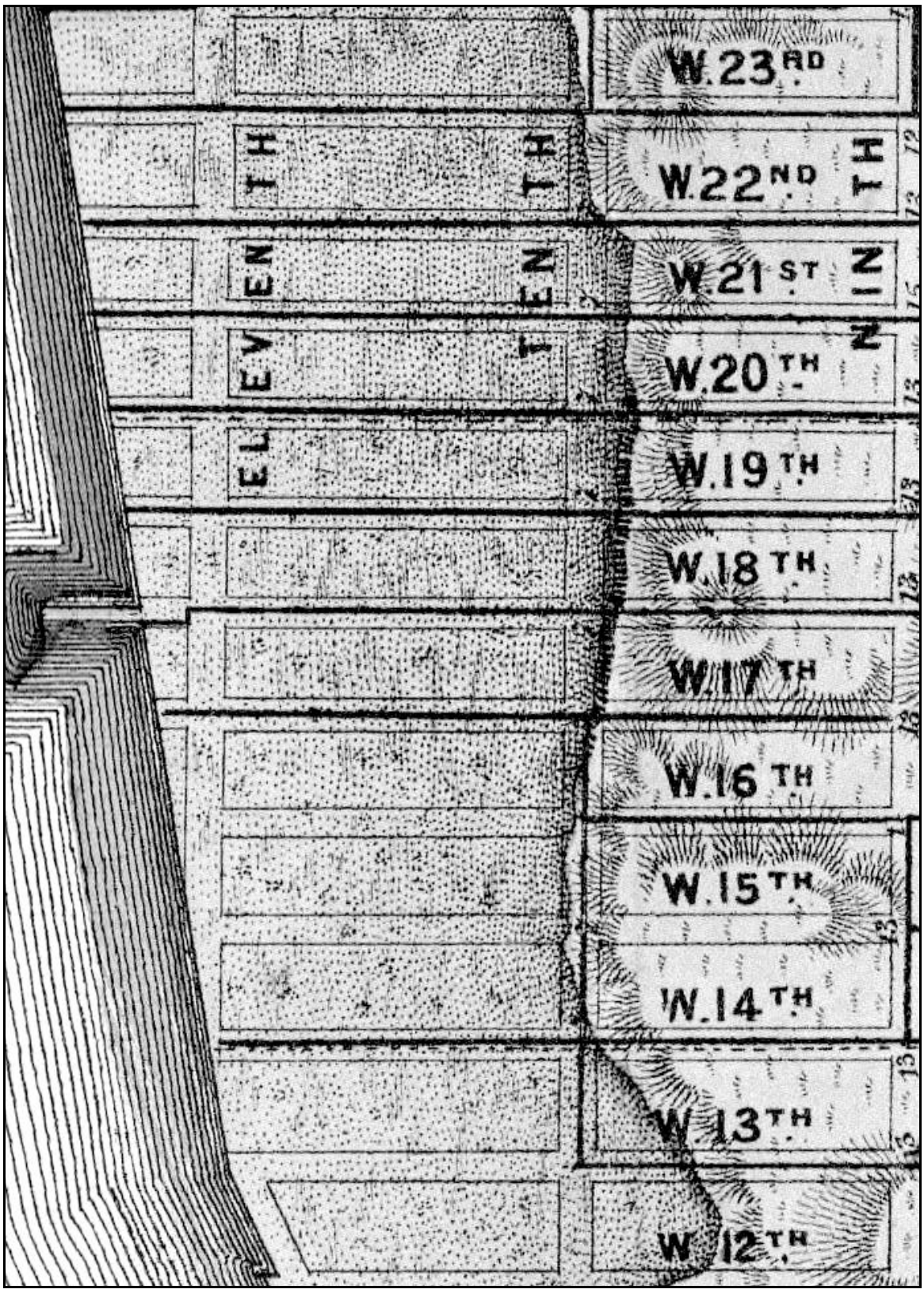


Figure 5: 1836 Colton map

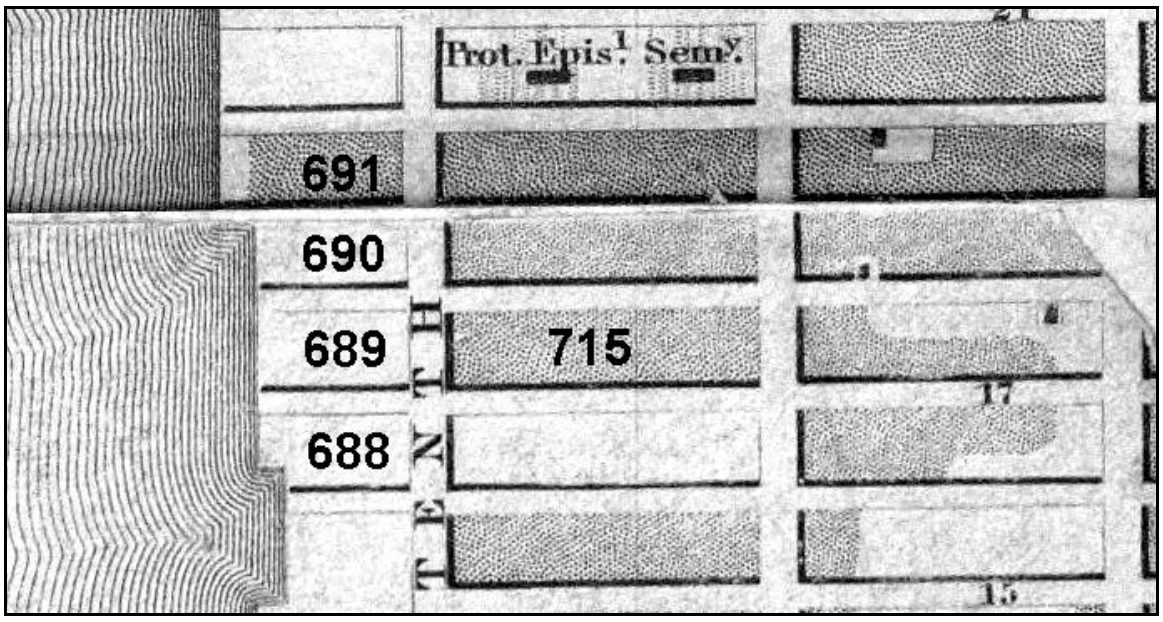


Figure 6a: 1852 Dripps map, Blocks 688 and 689

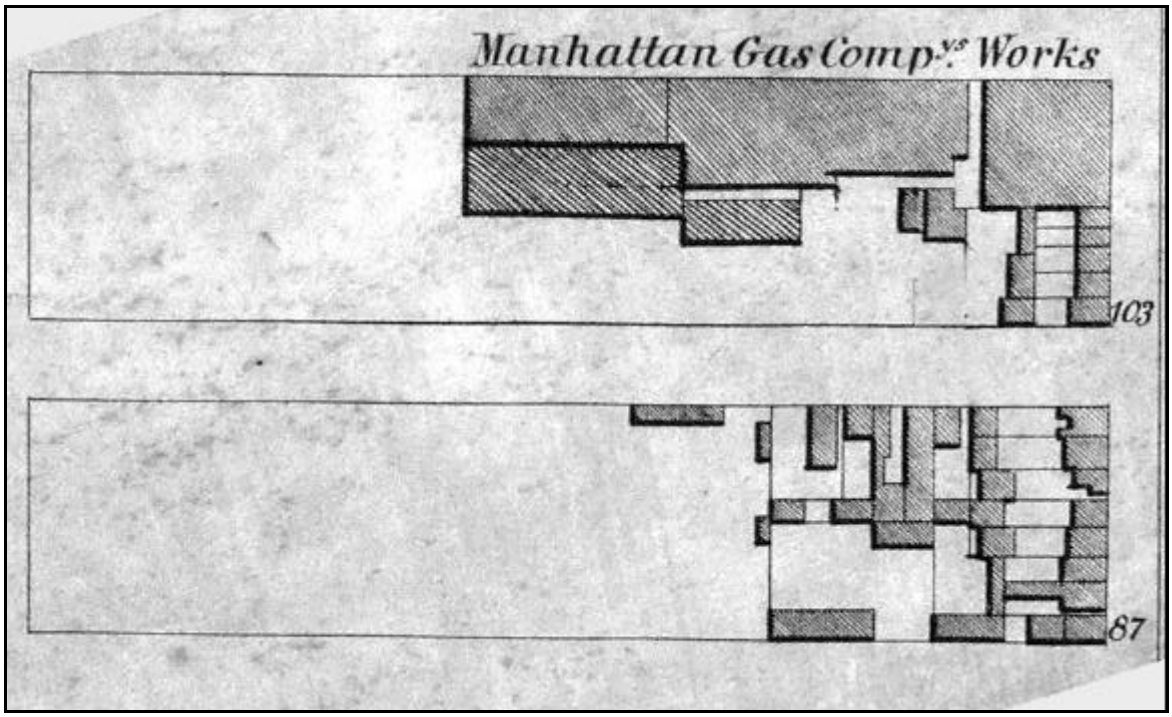


Figure 6b: 1852 Dripps map, Blocks 690 and 691

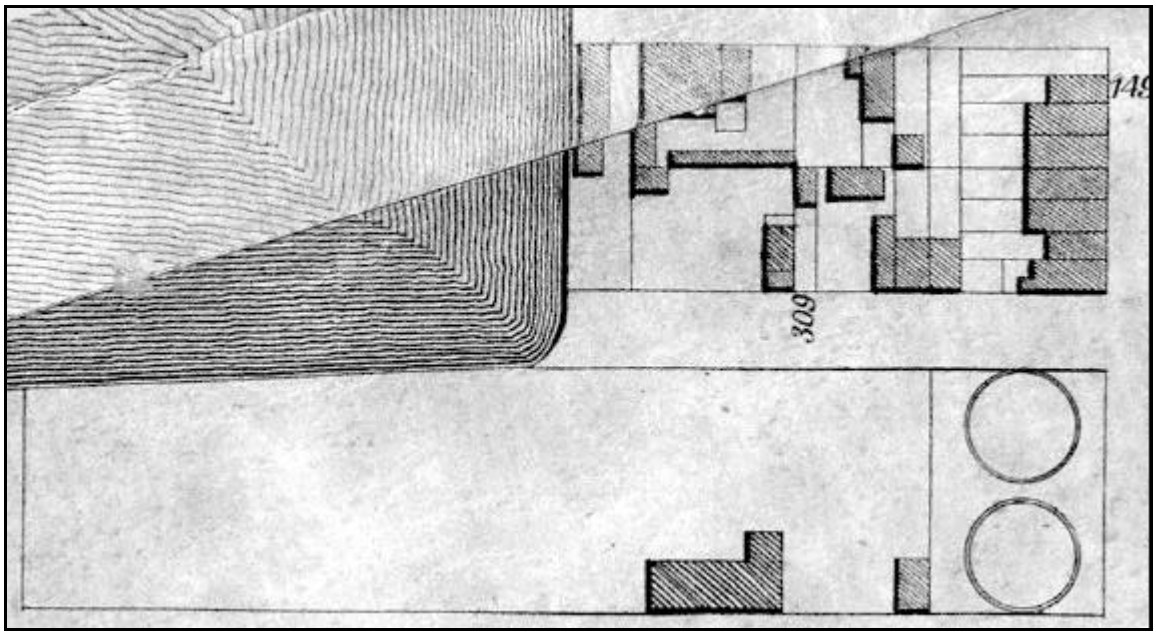


Figure 6c: 1852 Dripps map, Block 715

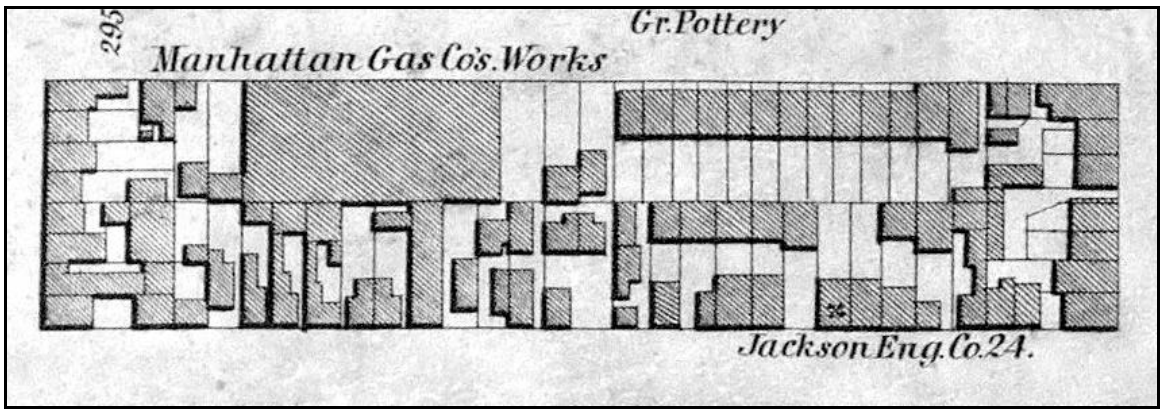


Figure 6d: 1852 Dripps map, Blocks 666 south and 666 center

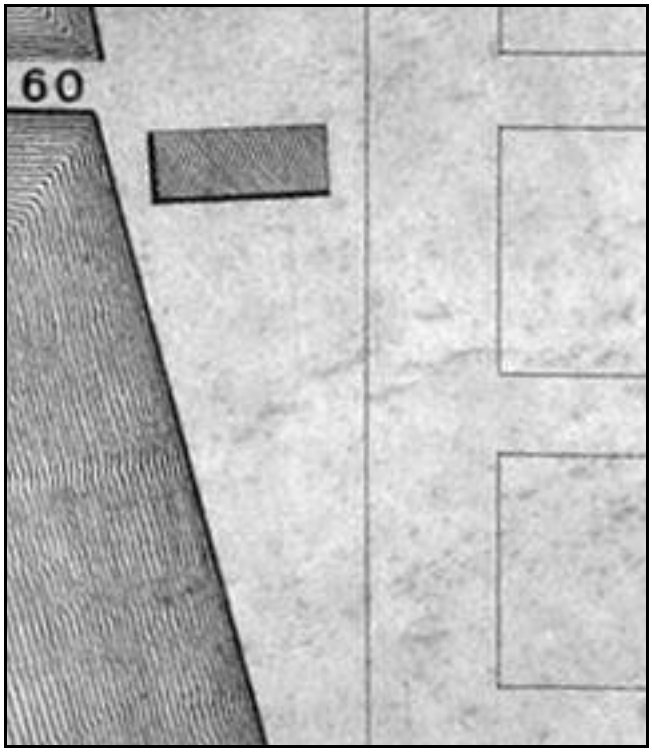


Figure 7a: 1859 Perris and Company map, Block 688

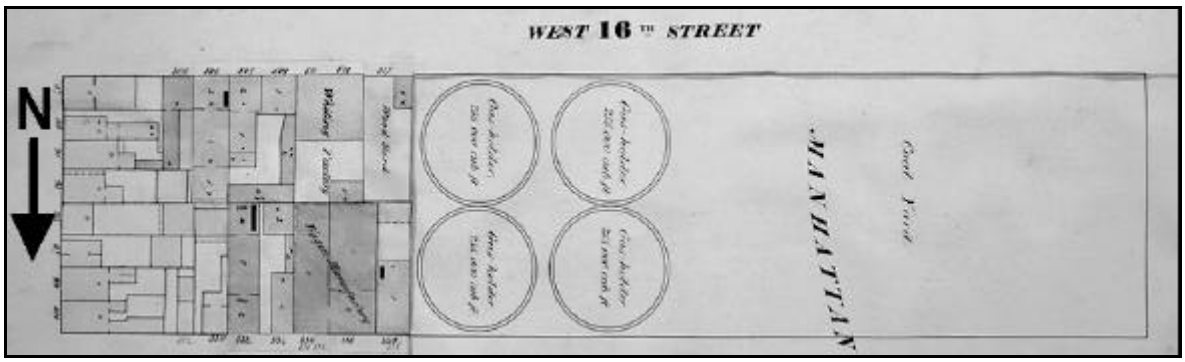


Figure 7b: 1859 Perris and Company map, Blocks 689 and 690

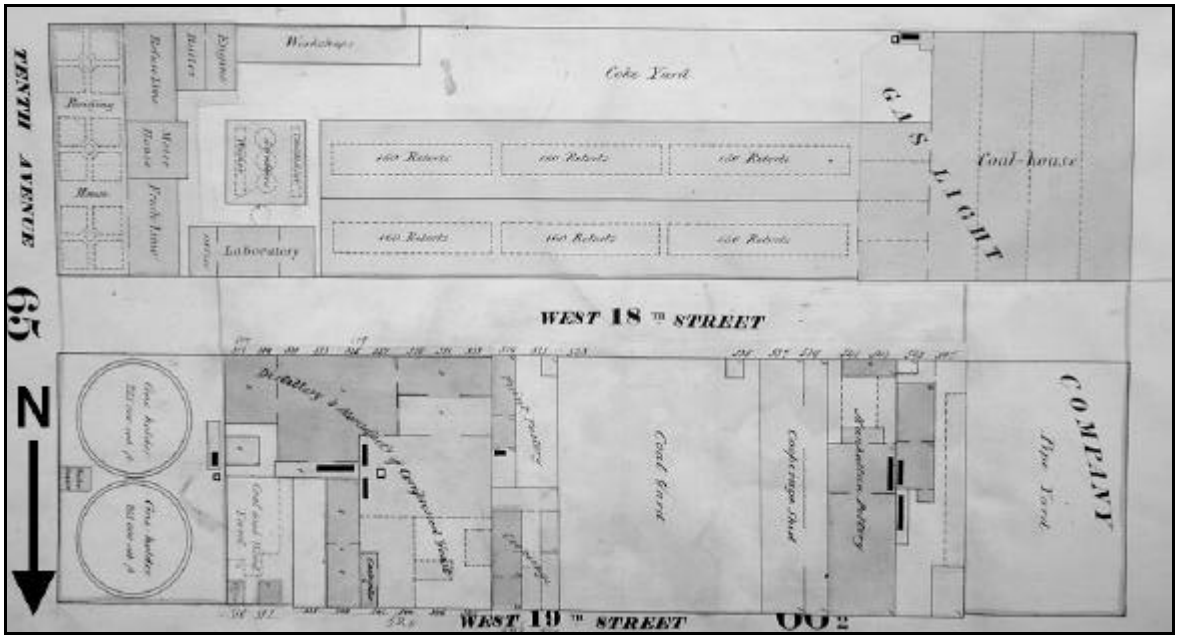


Figure 7c: 1859 Perris and Company map, Block 691

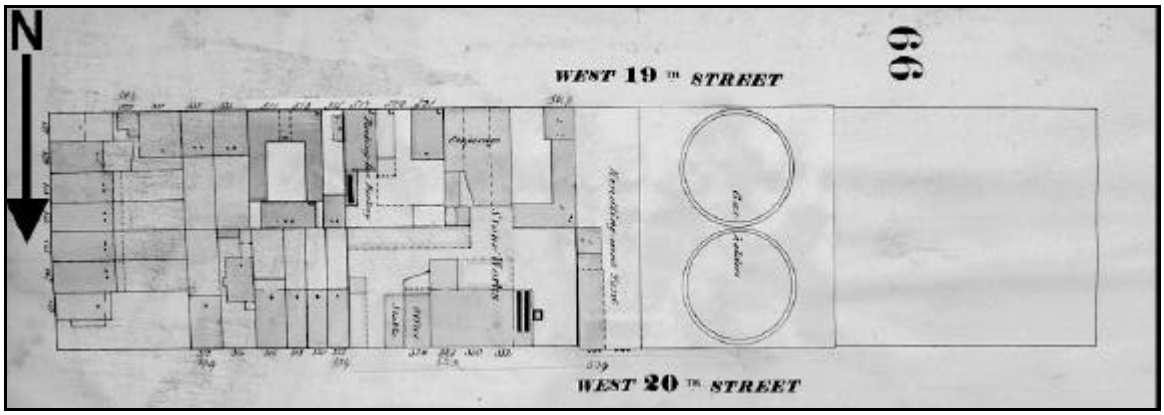


Figure 7d: 1859 Perris and Company map, Block 715

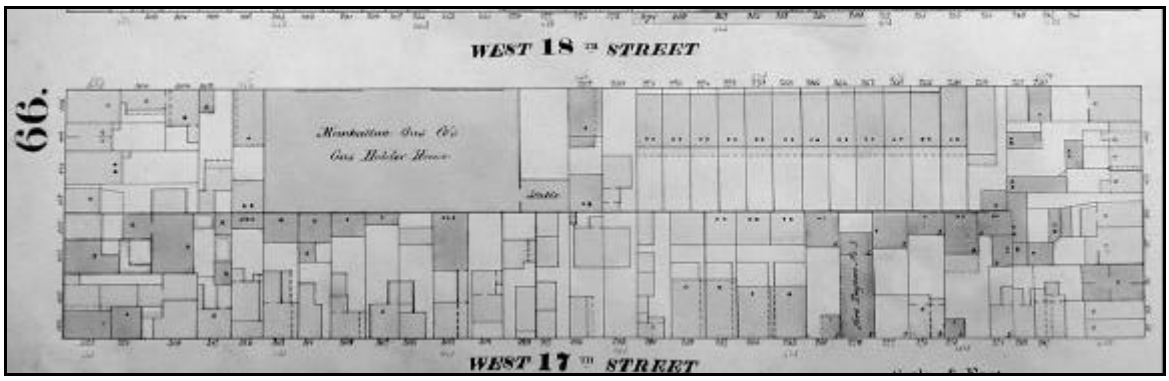


Figure 7e: 1859 Perris and Company map, Blocks 666 center and south

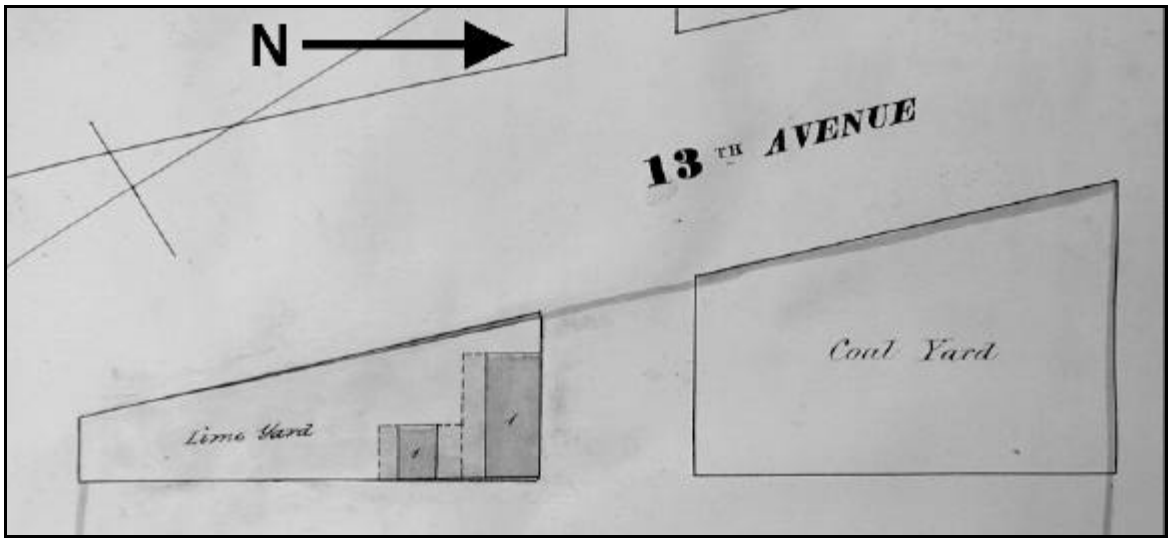


Figure 8a: 1867 Dripps map, Blocks 688-691

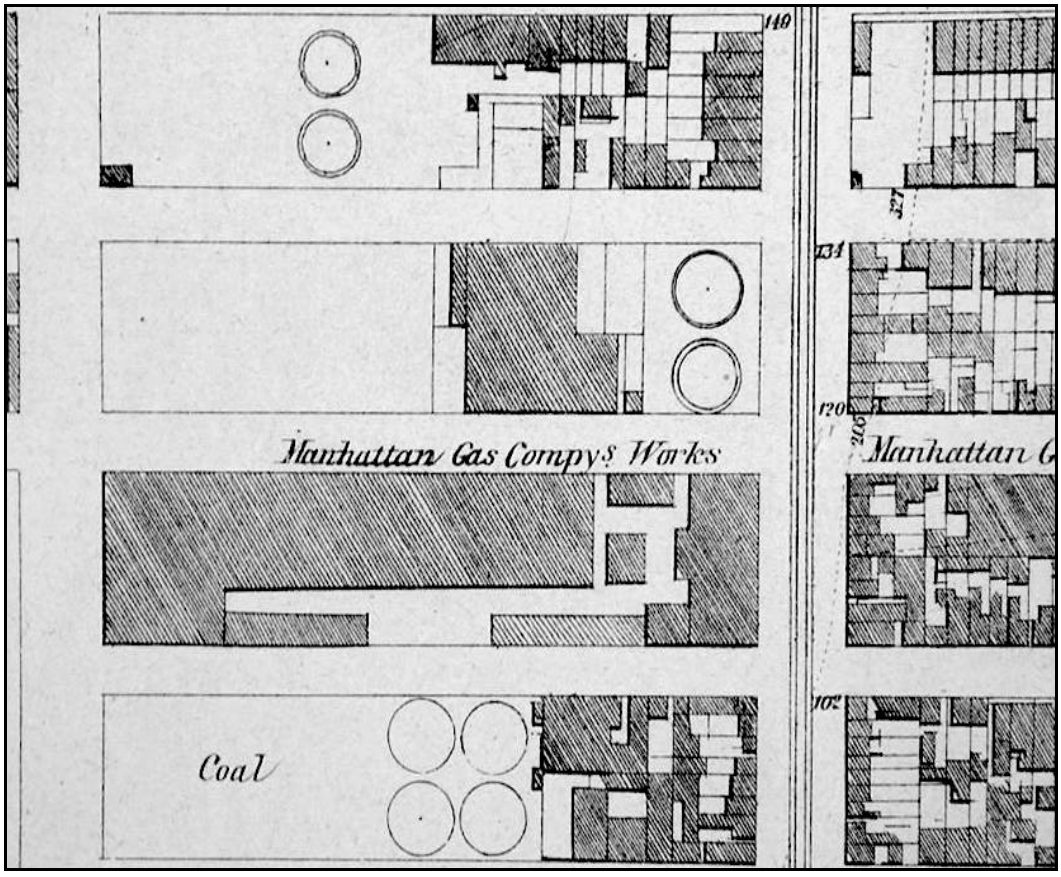


Figure 8b: 1867 Dripps map, Block 715

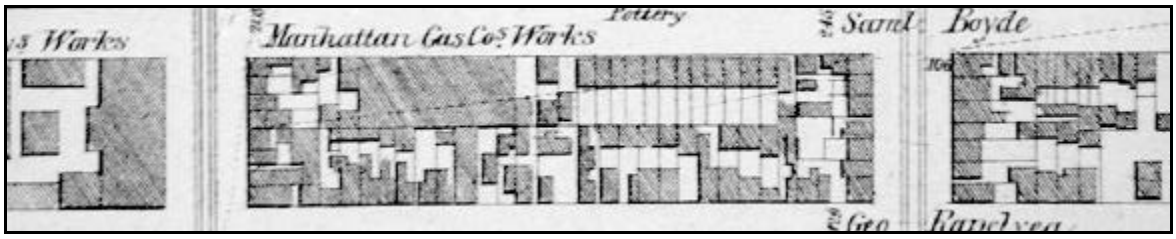


Figure 9a: 1869 Perris and Browne map, Blocks 688 and 689

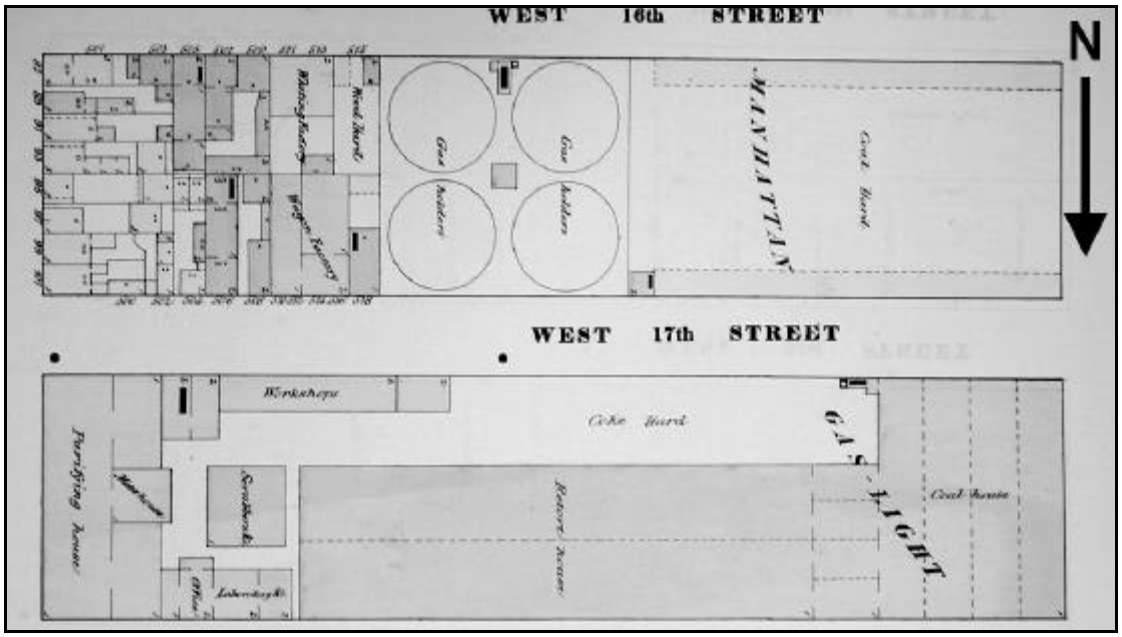


Figure 9b: 1869 Perris and Browne map, Blocks 690 and 691

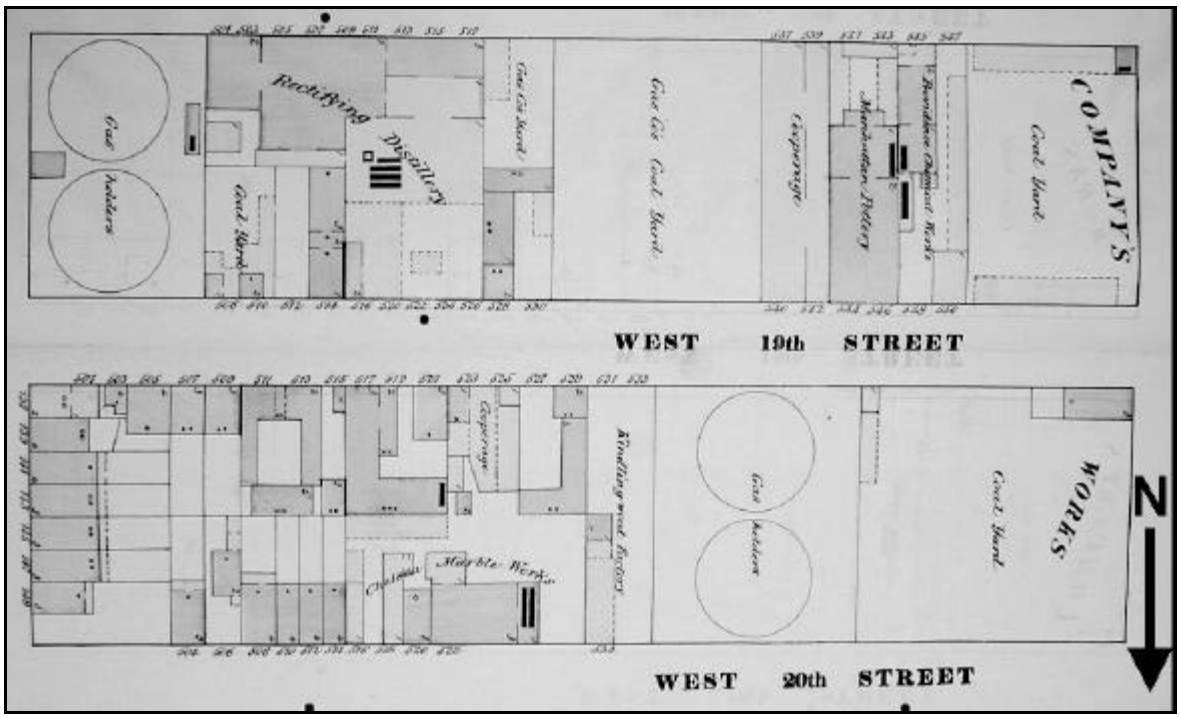


Figure 9c: 1869 Perris and Browne map, Block 715

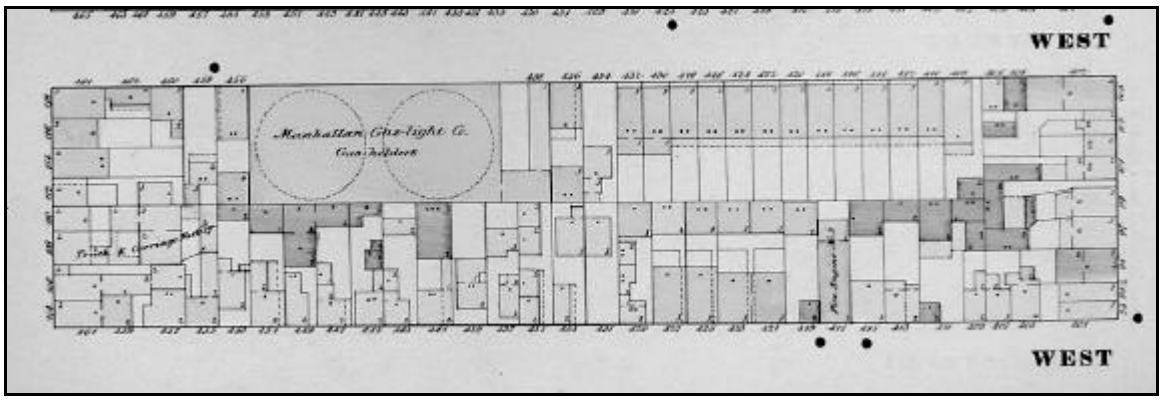


Figure 9d: 1869 Perris and Browne map, Blocks 666 center and south

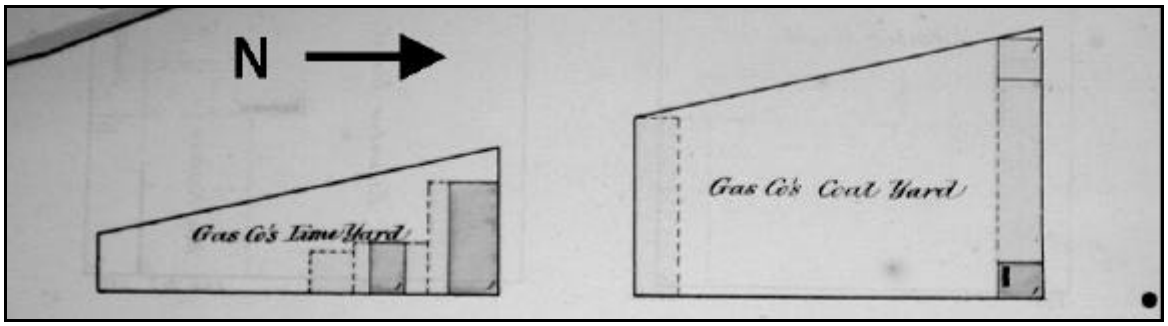


Figure 10a: 1874 Perris and Browne map, Block 688

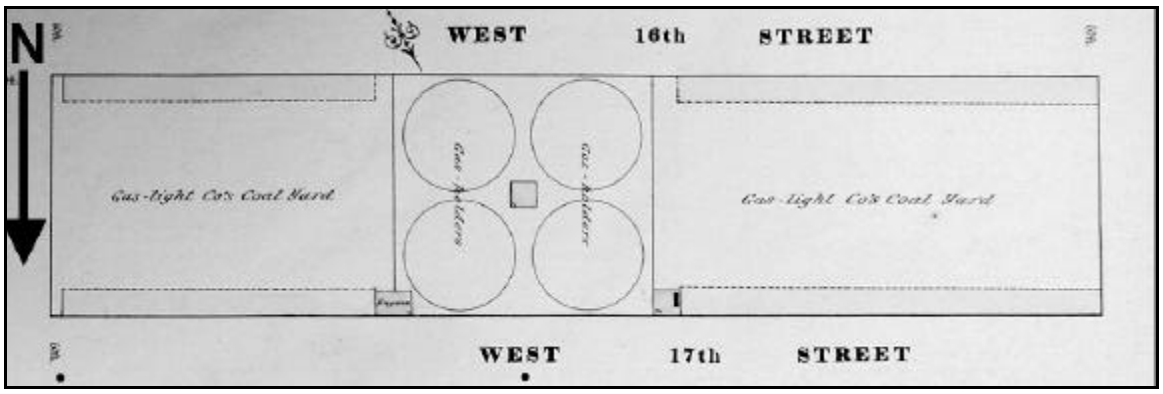


Figure 10b: 1874 Perris and Browne map, Block 689

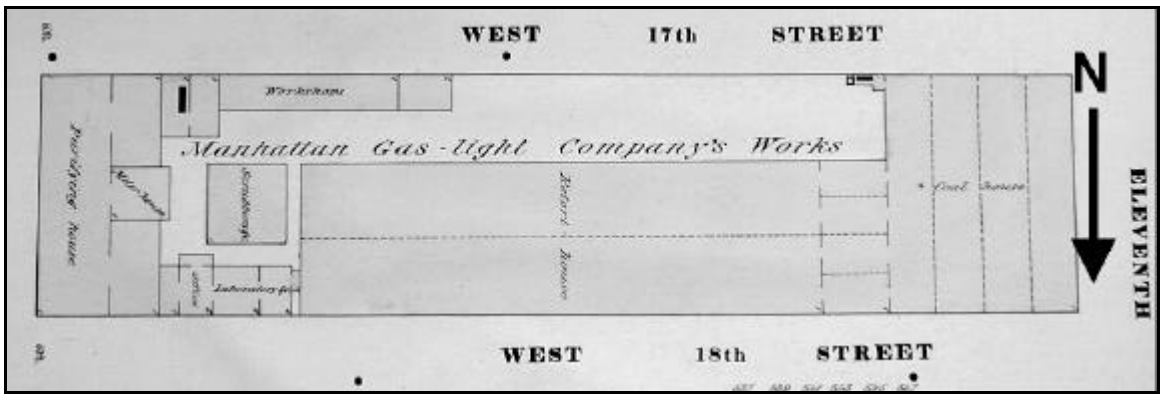


Figure 10c: 1874 Perris and Browne map, Blocks 690 and 691

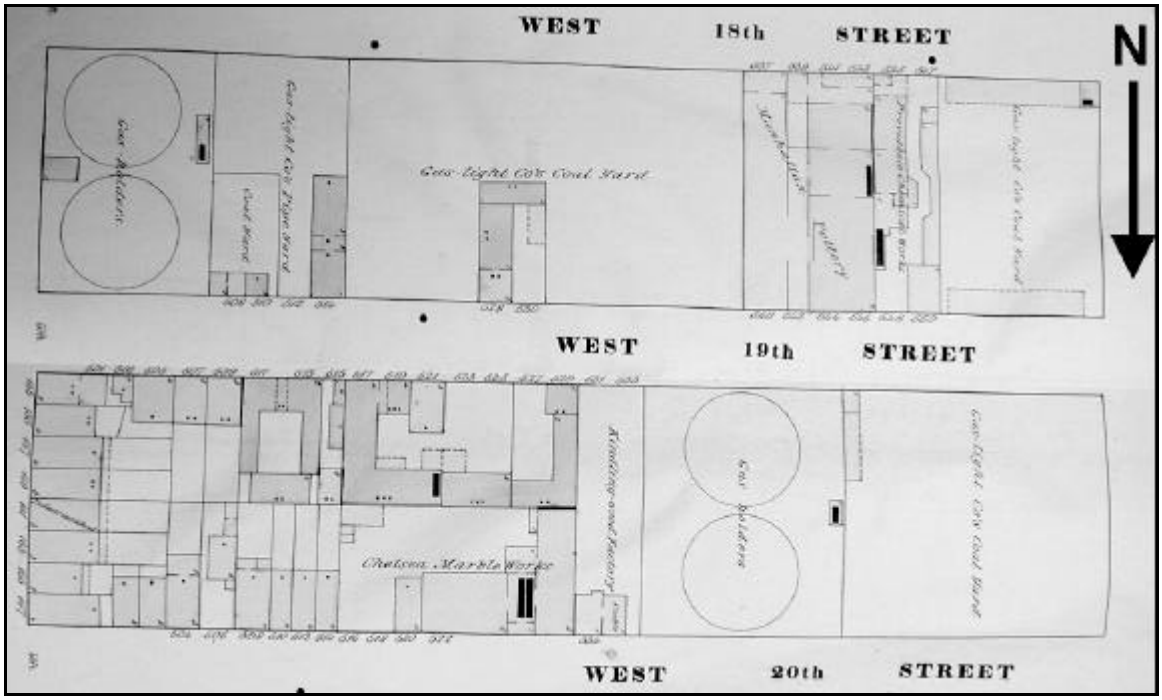


Figure 10d: 1874 Perris and Browne map, Block 715

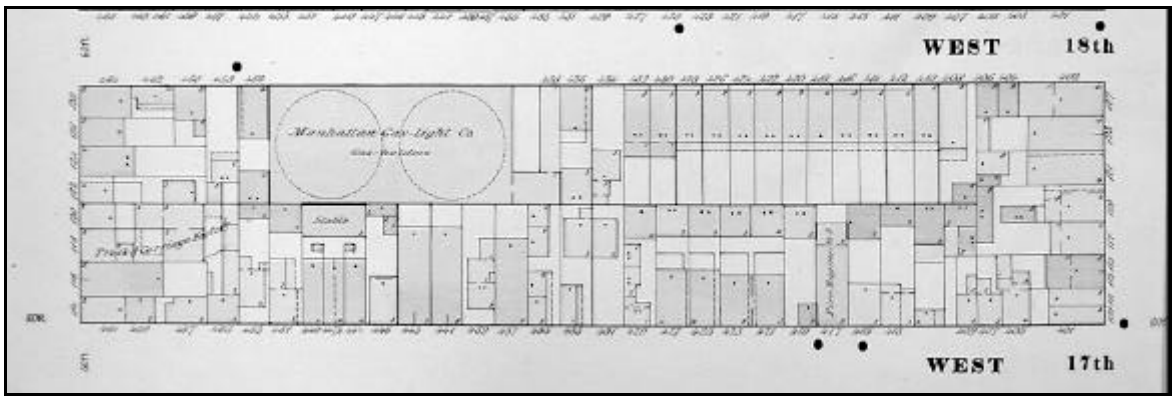


Figure 10e: 1874 Perris and Browne map, Blocks 666 south and 666 center

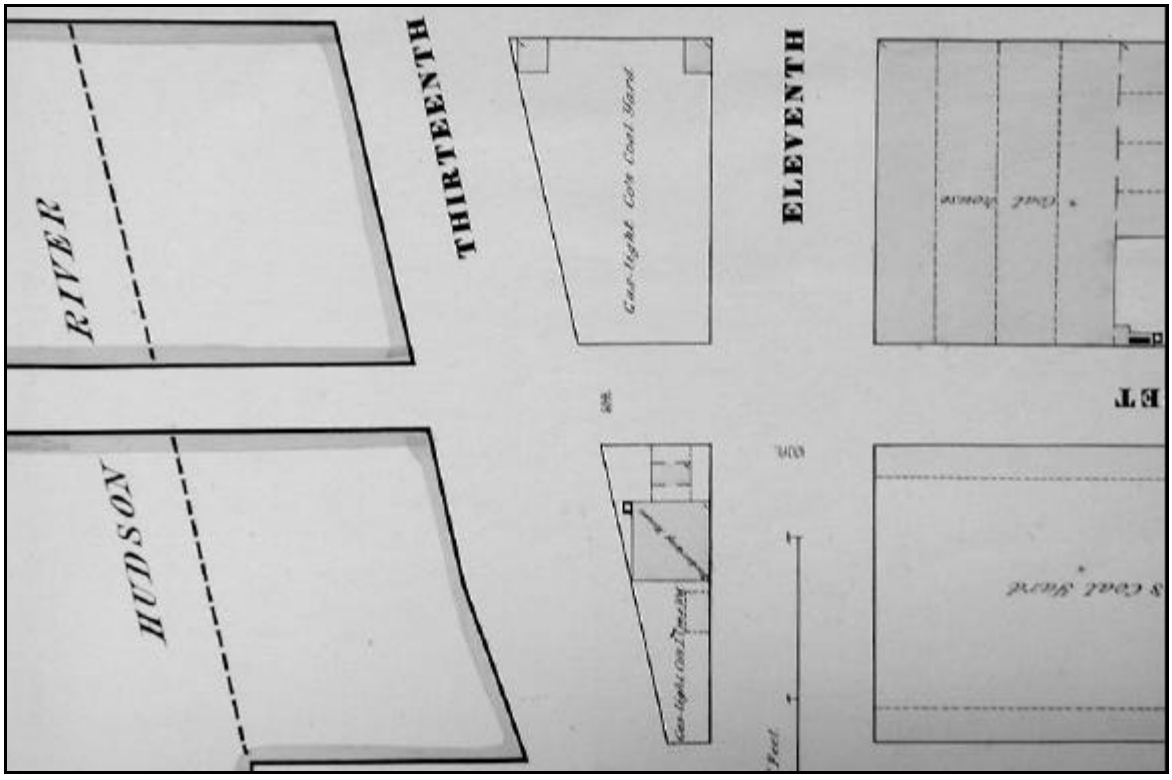


Figure 11: 1879 Taylor Bird's Eye Drawing

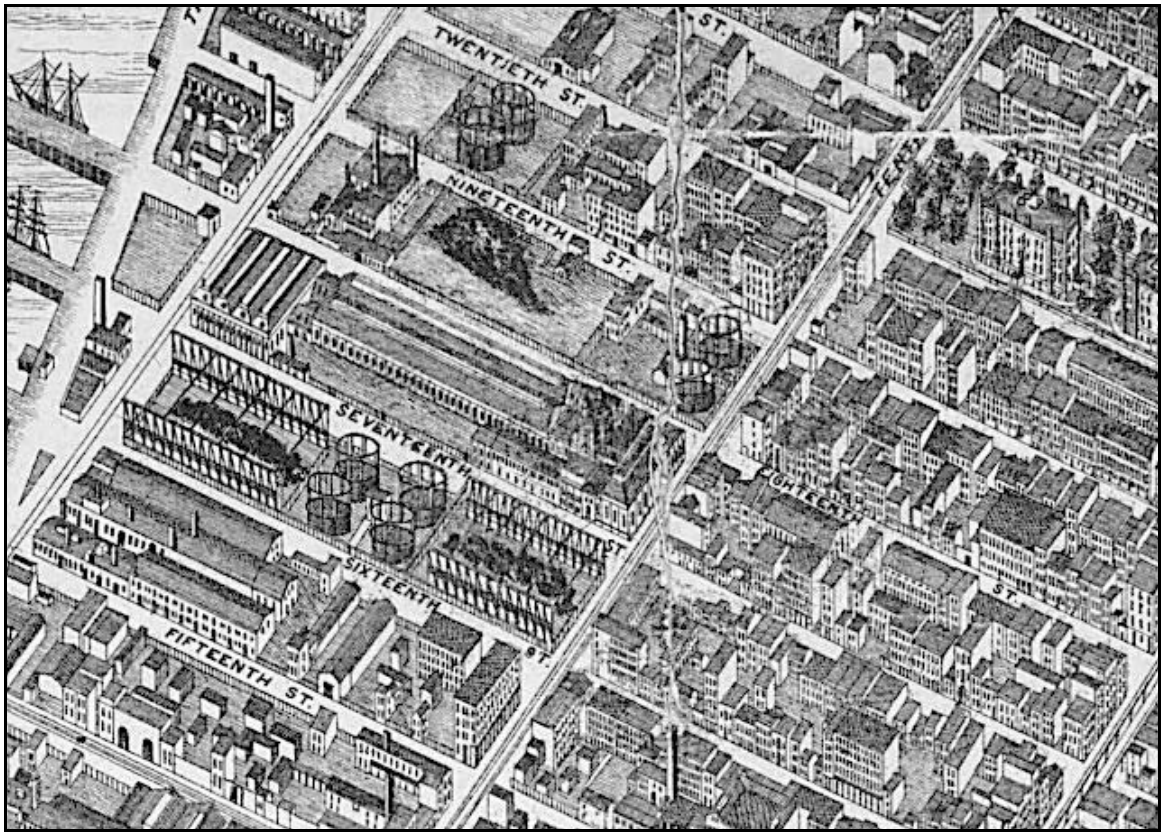


Figure 12a: 1887 Perris and Browne map, Blocks 688 and 689

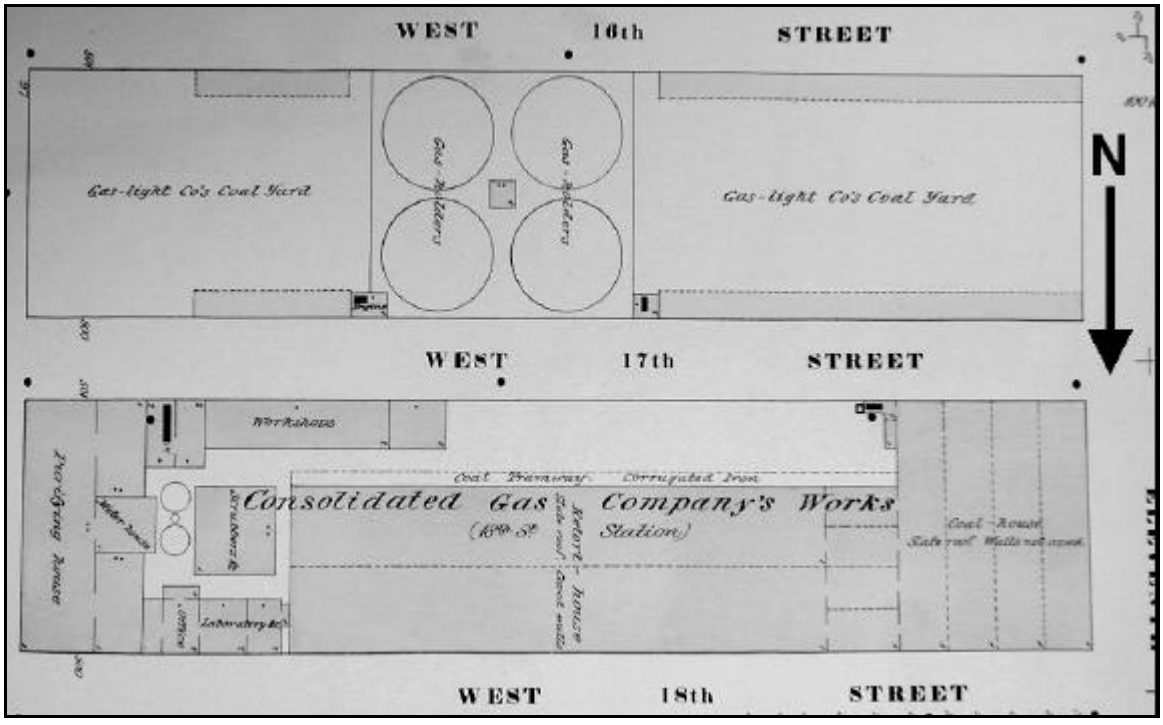


Figure 12b: 1887 Perris and Browne map, Blocks 690 and 691

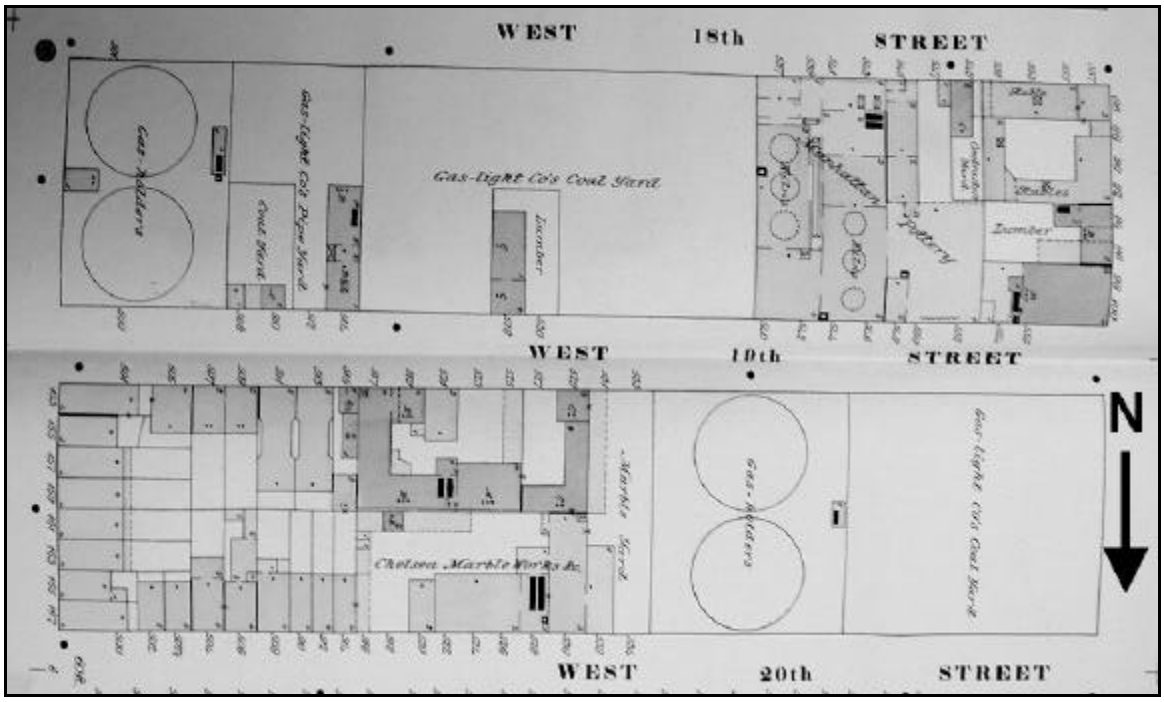


Figure 12c: 1887 Perris and Browne map, Block 715

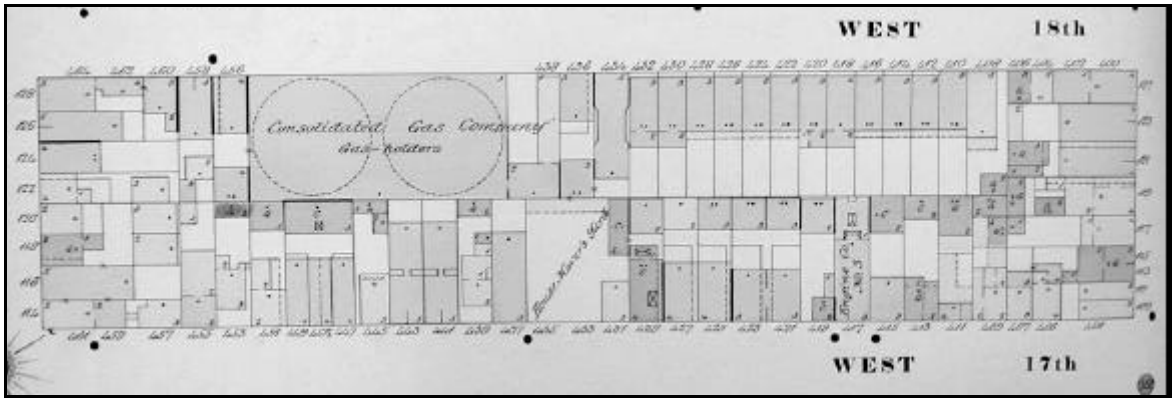


Figure 12d: 1887 Perris and Browne map, Blocks 666 south and 666 center

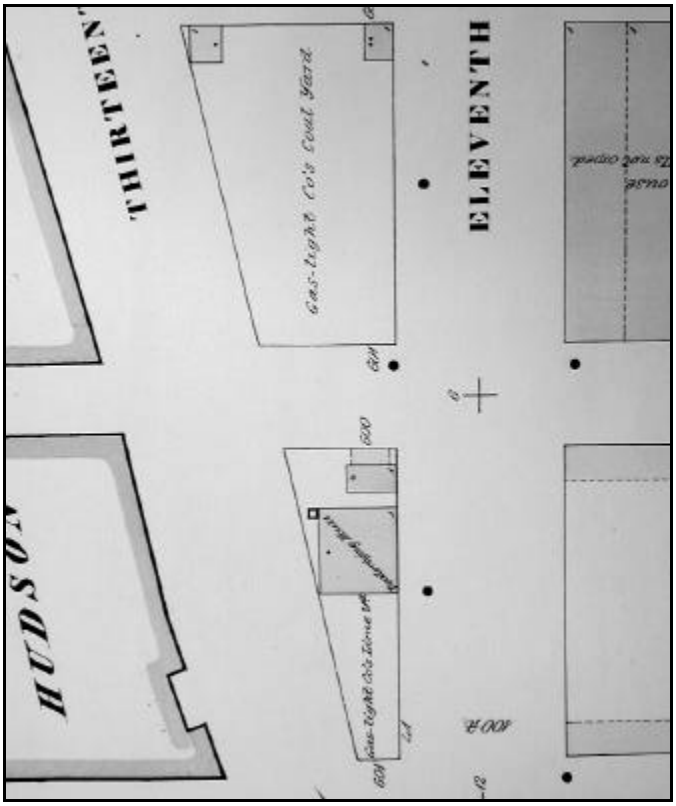


Figure 14: 1901 Docks and Ferries Map (Blocks 688 and 689)

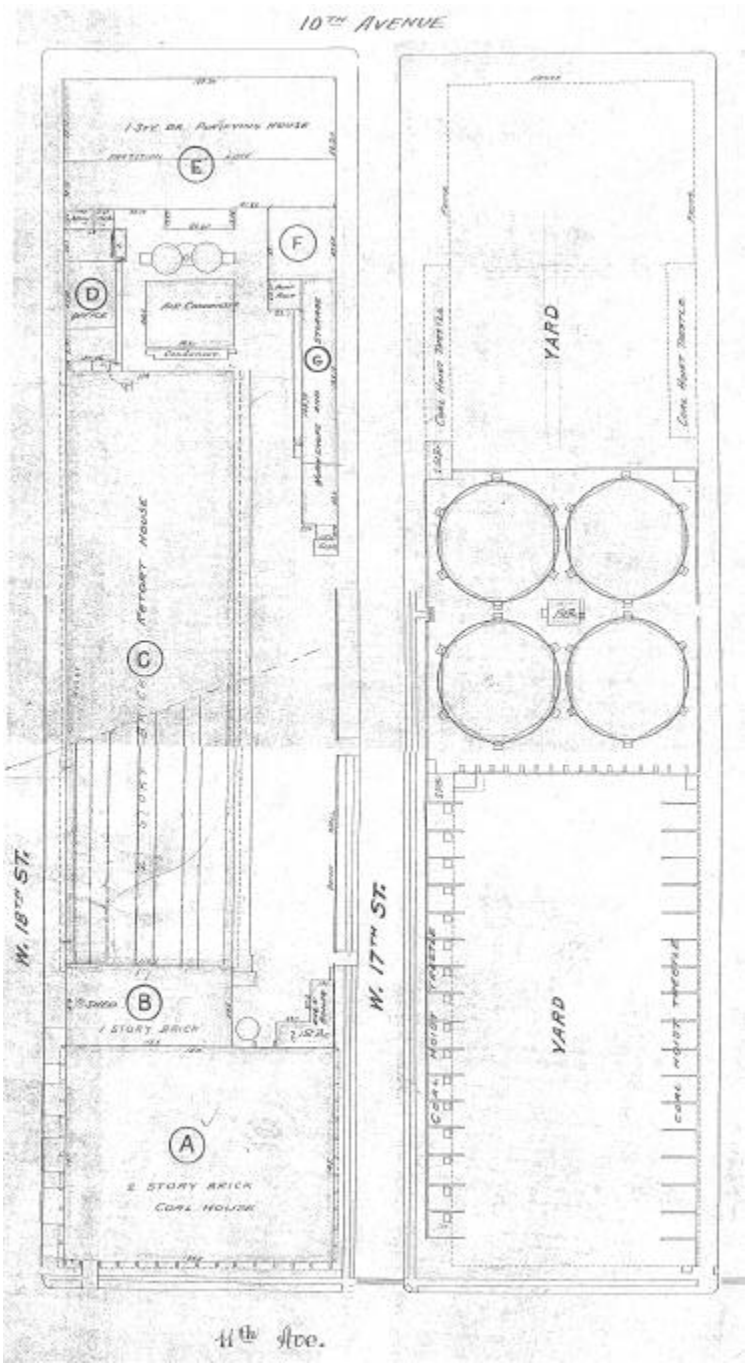


Figure 15: 1903 Docks and Ferries Map (Block 691)

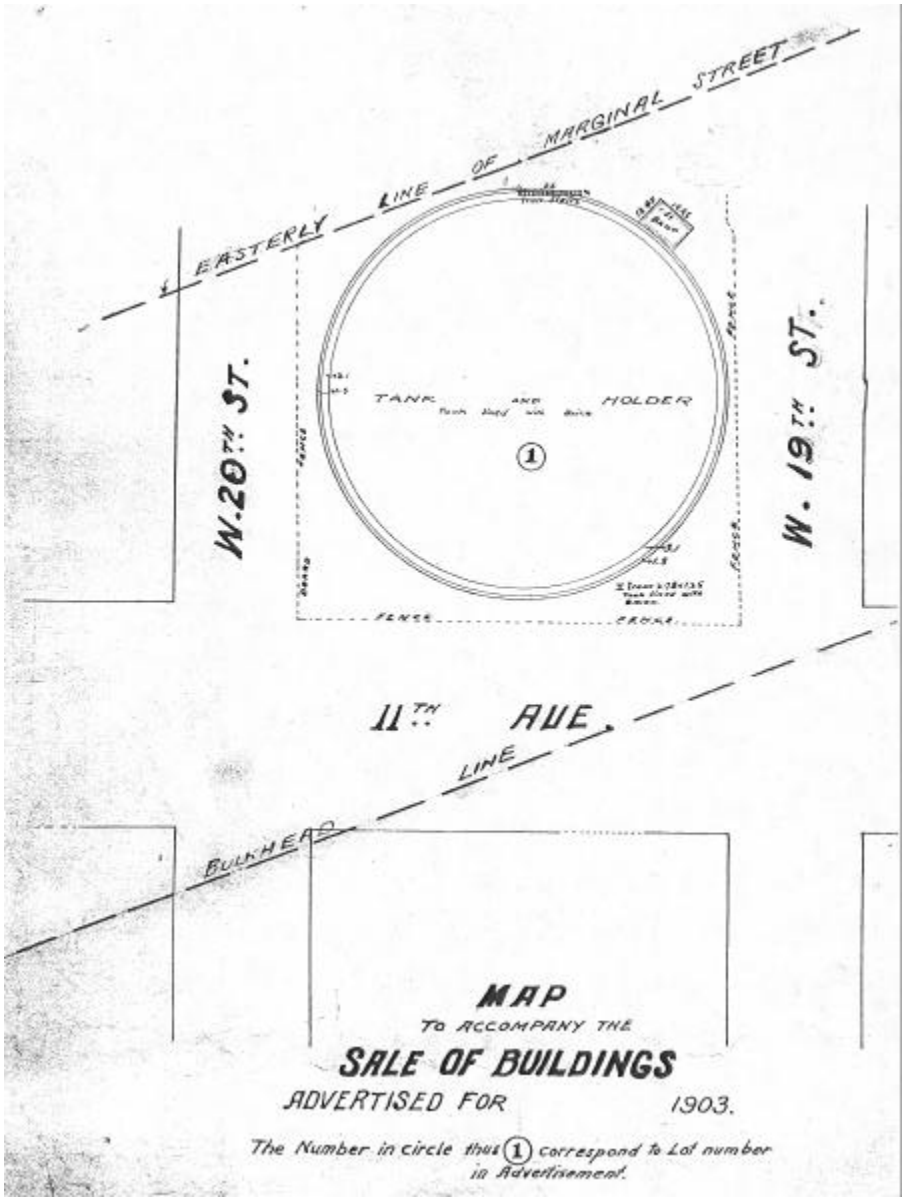


Figure 16: 1904 Docks and Ferries Map (Block 689)

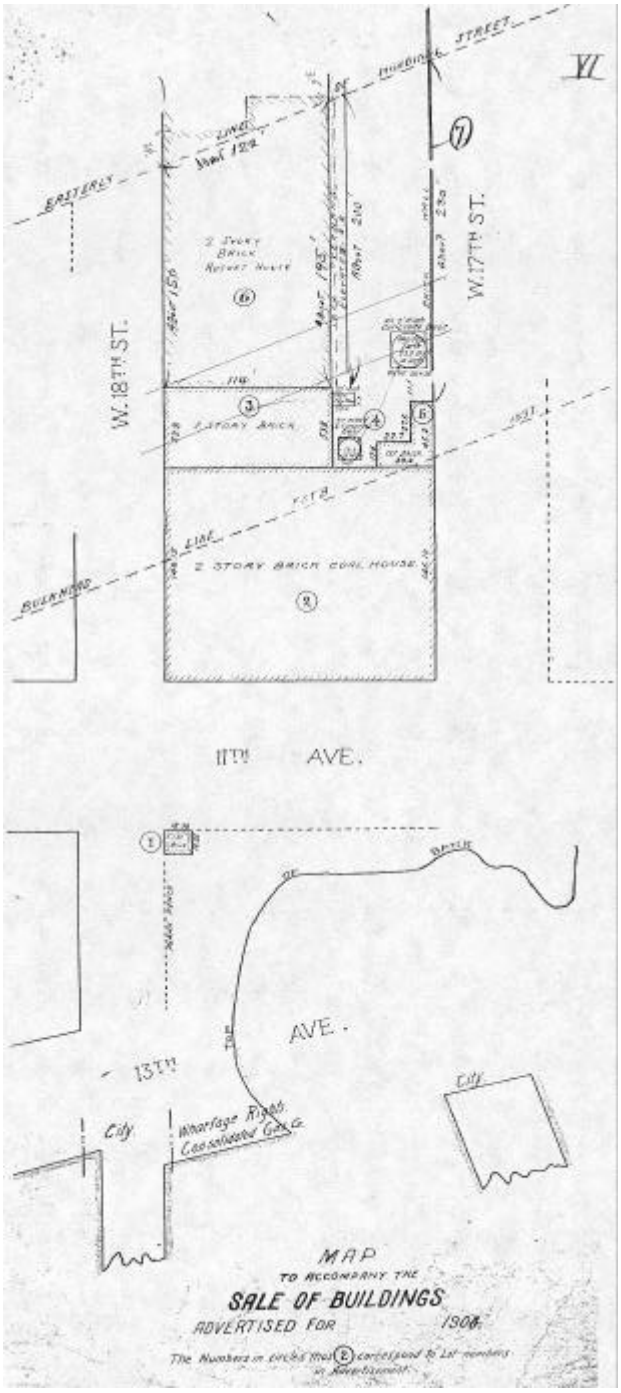


Figure 17: 1904 Docks and Ferries Map (Block 688)

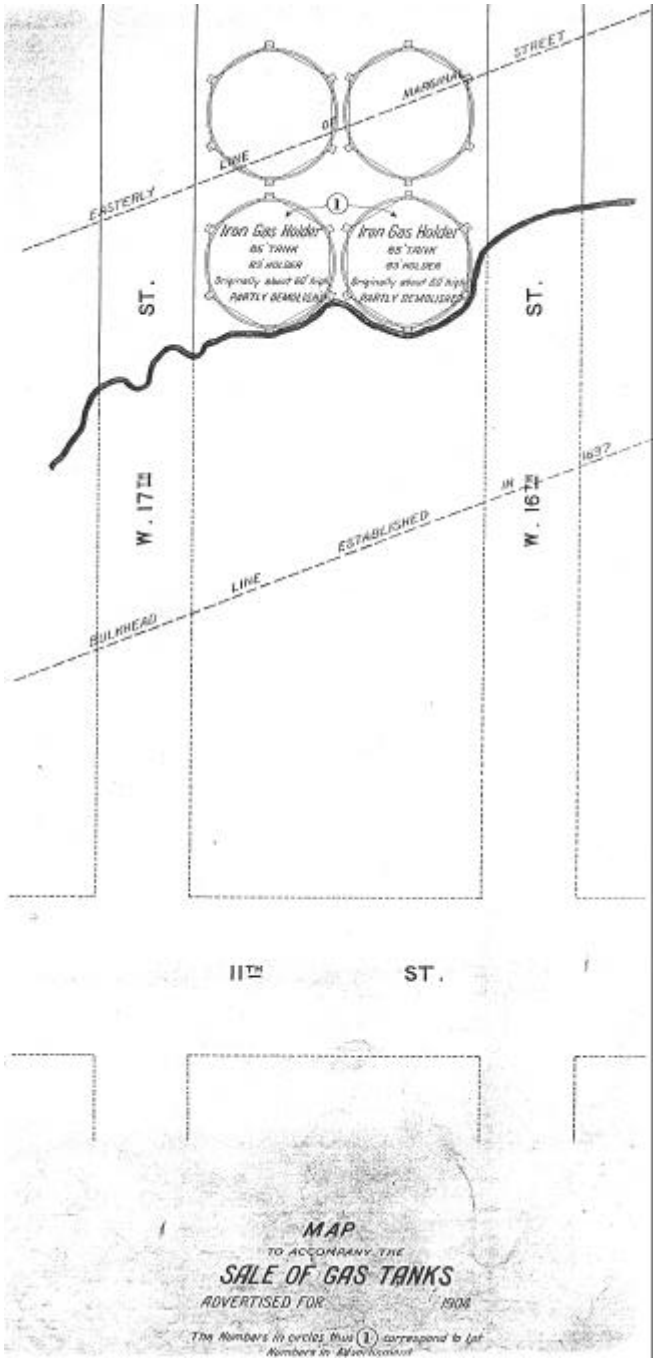
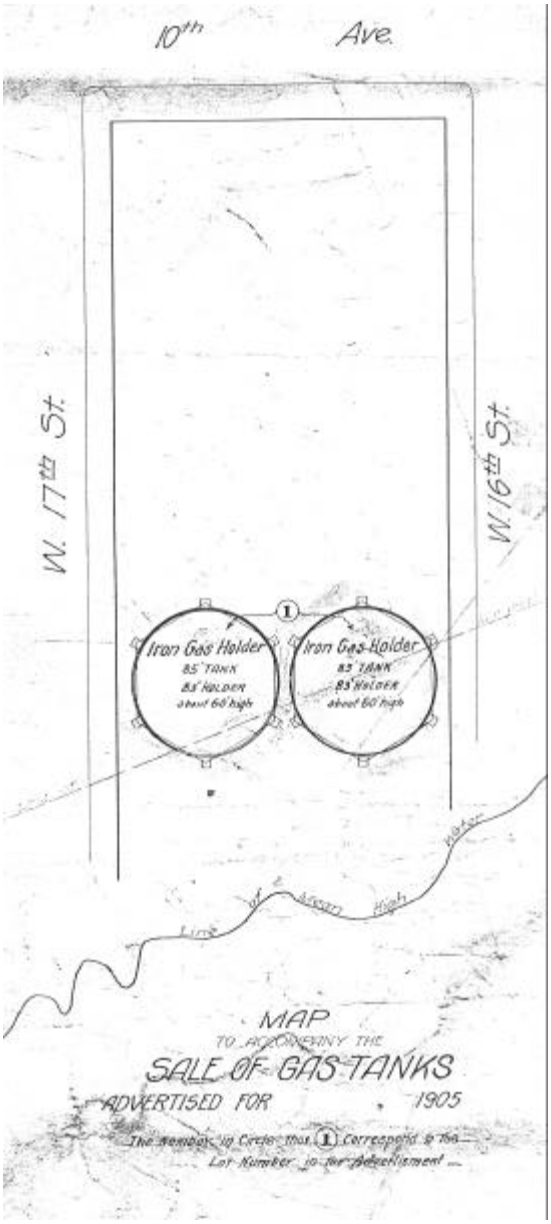
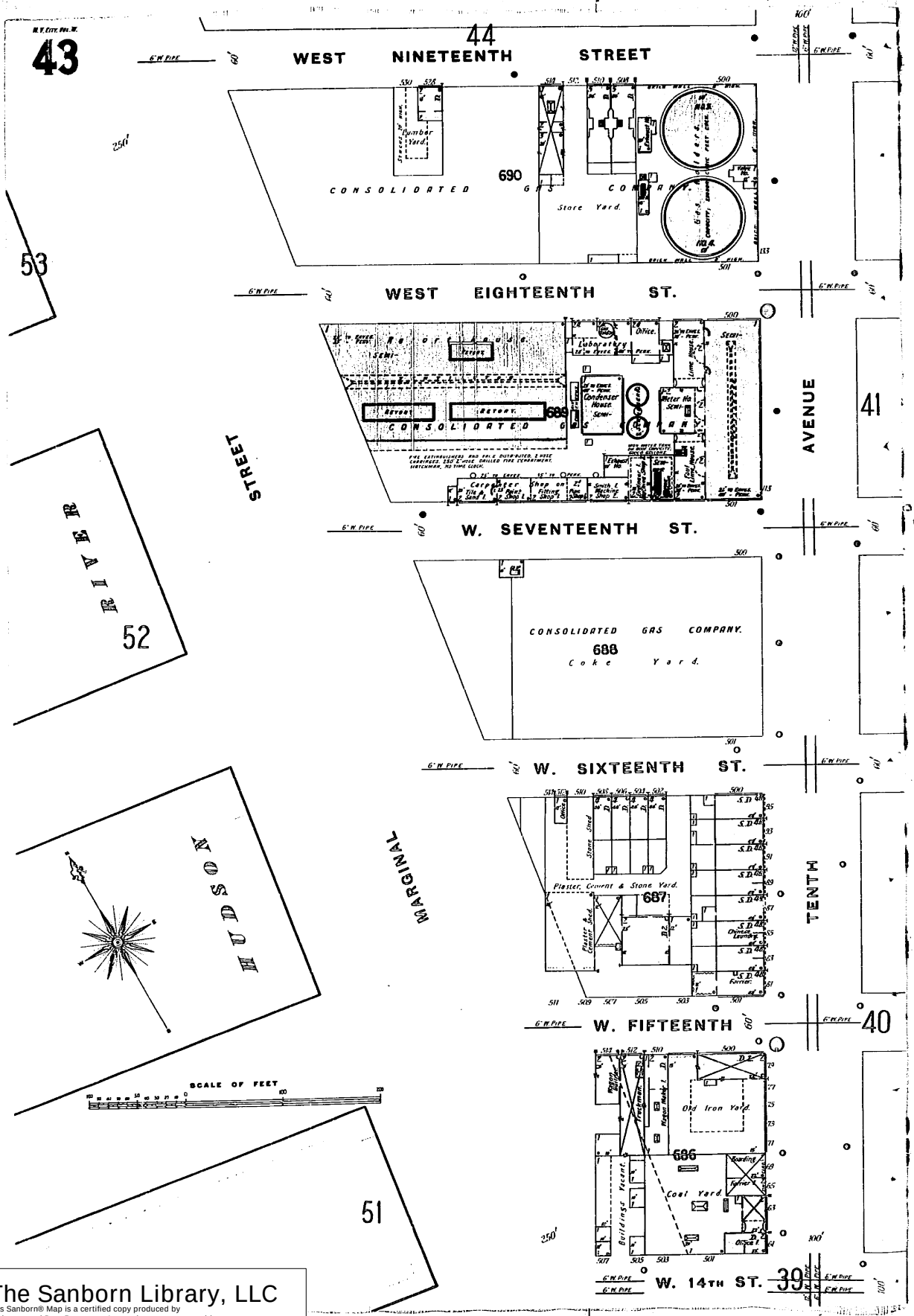
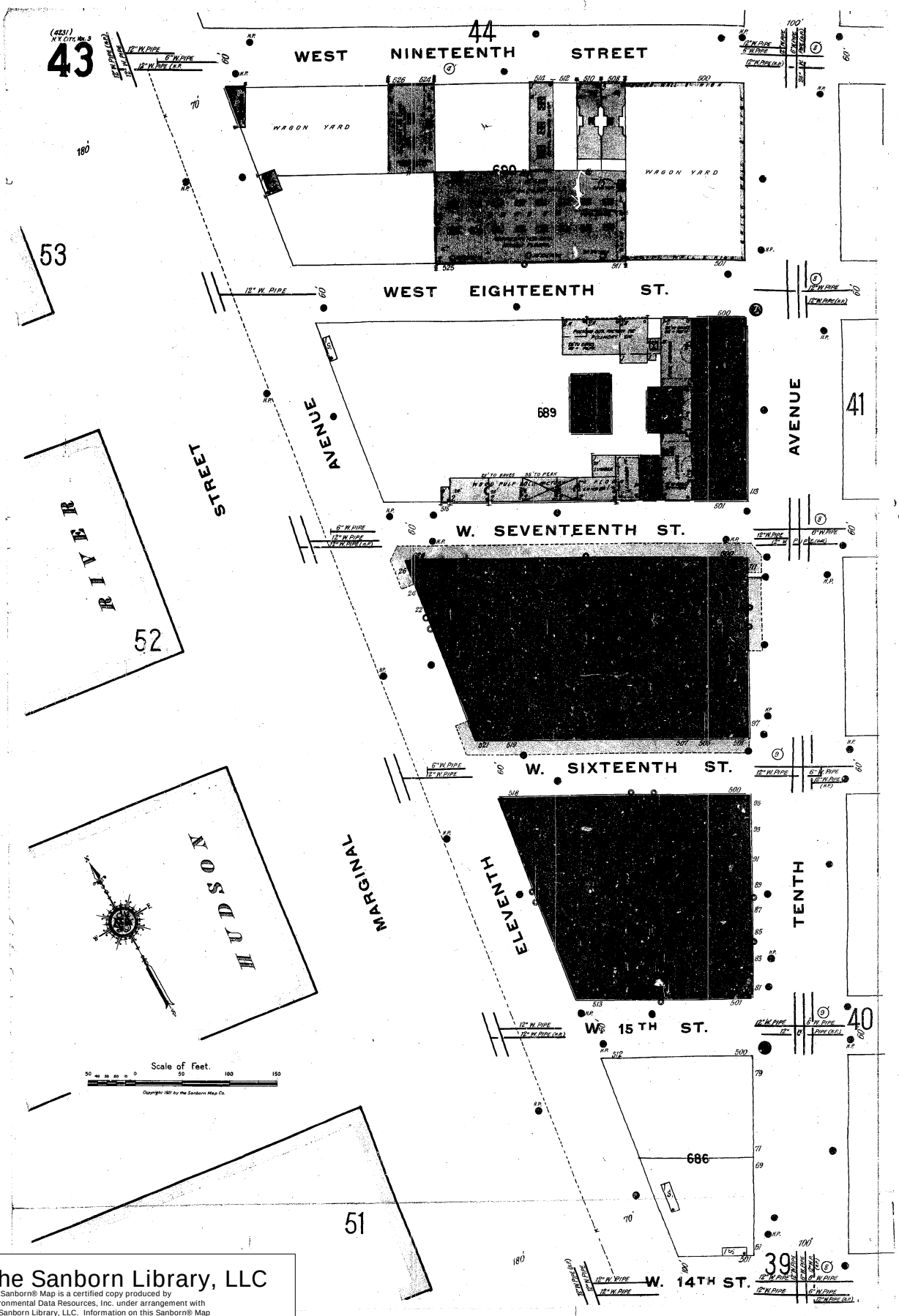
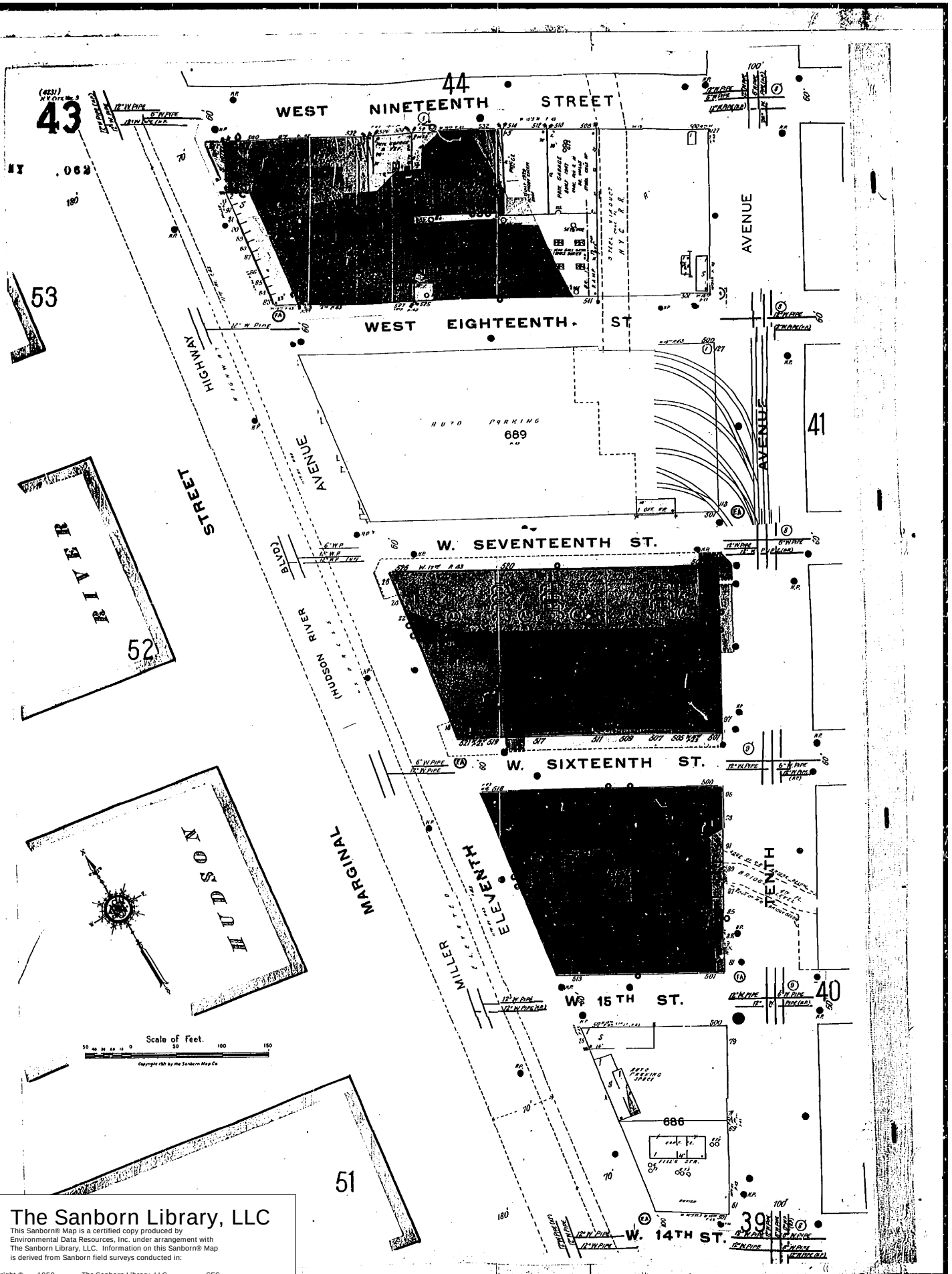


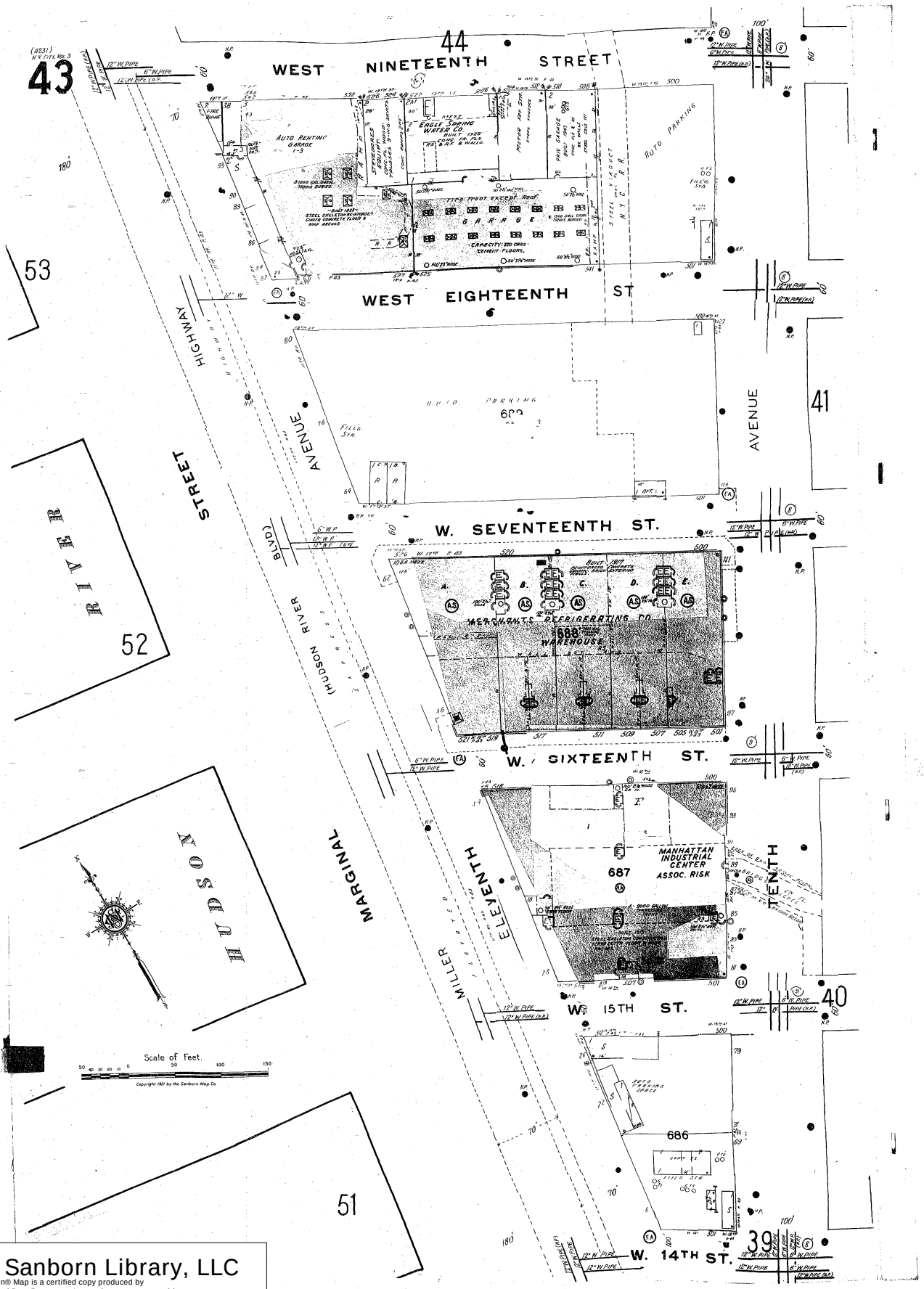
Figure 18: 1905 Docks and Ferries Map (Block 688)

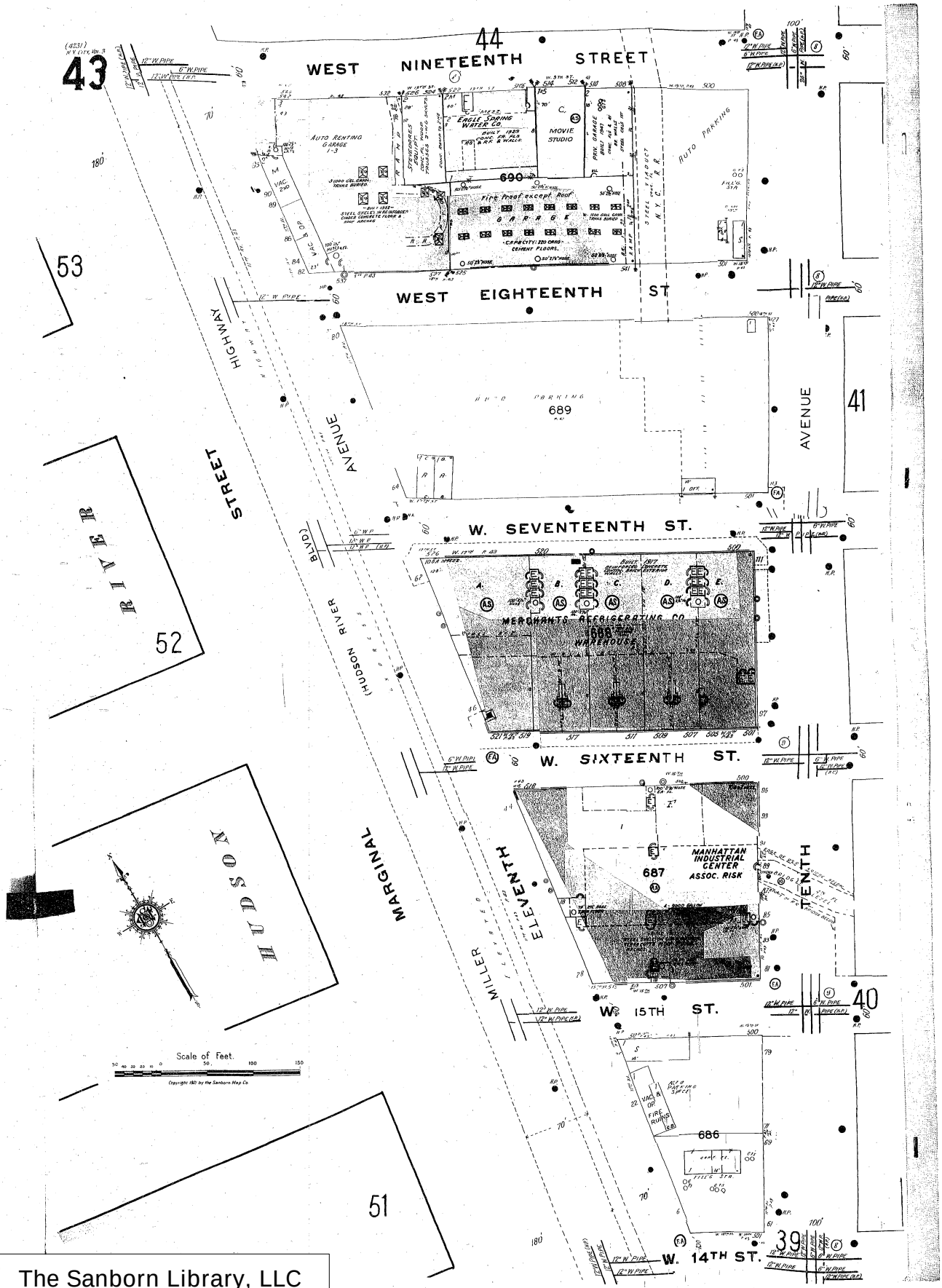


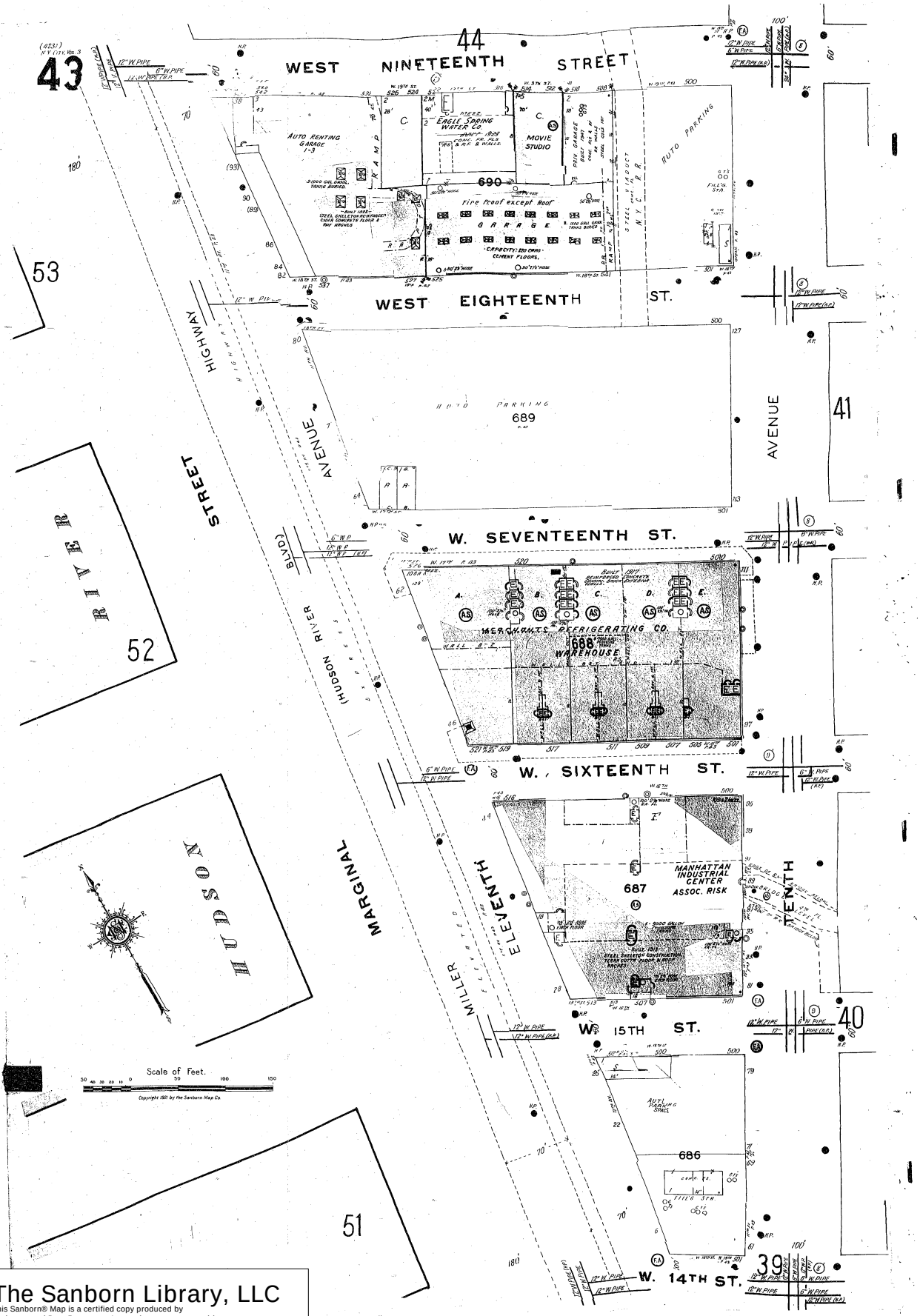


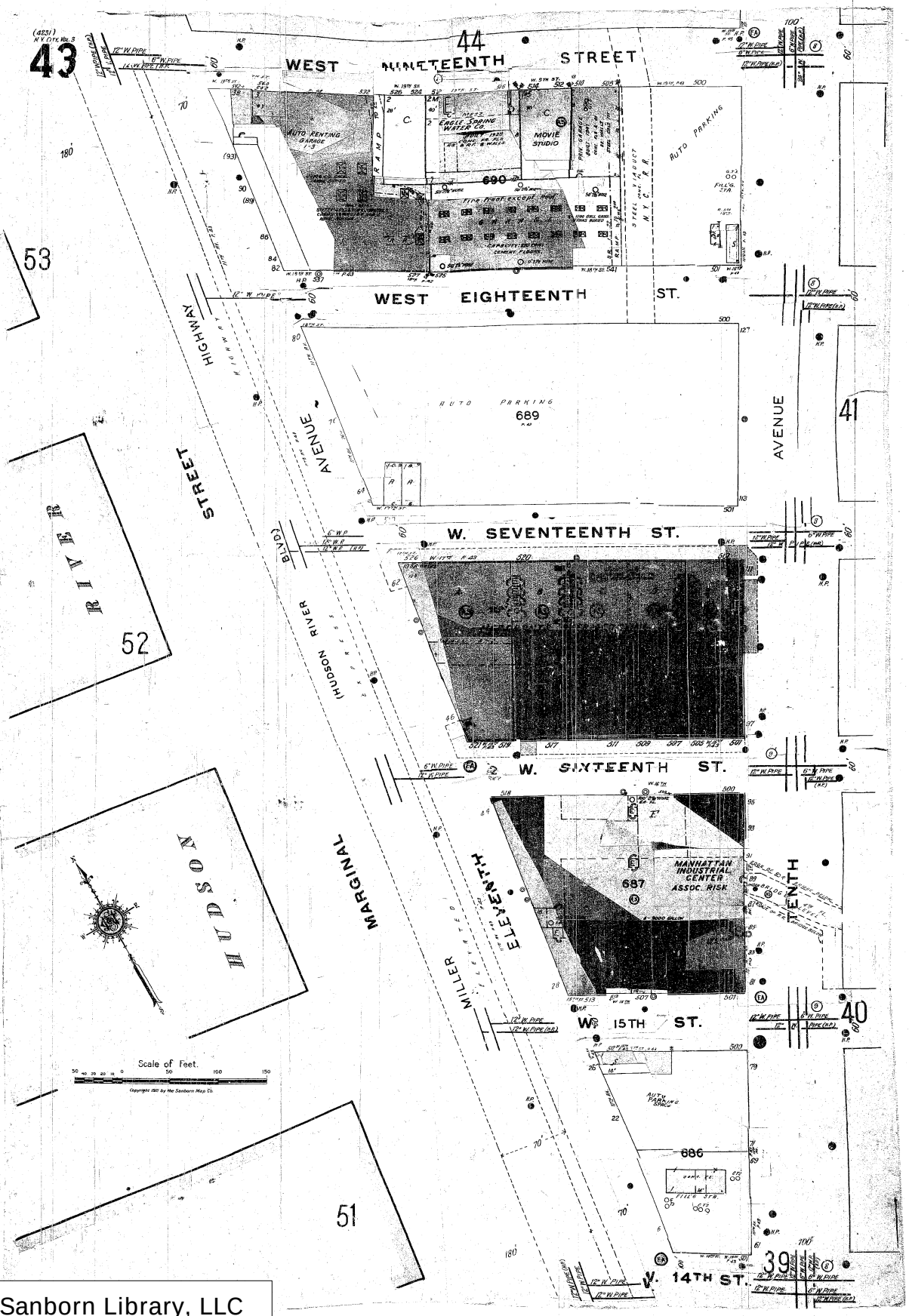


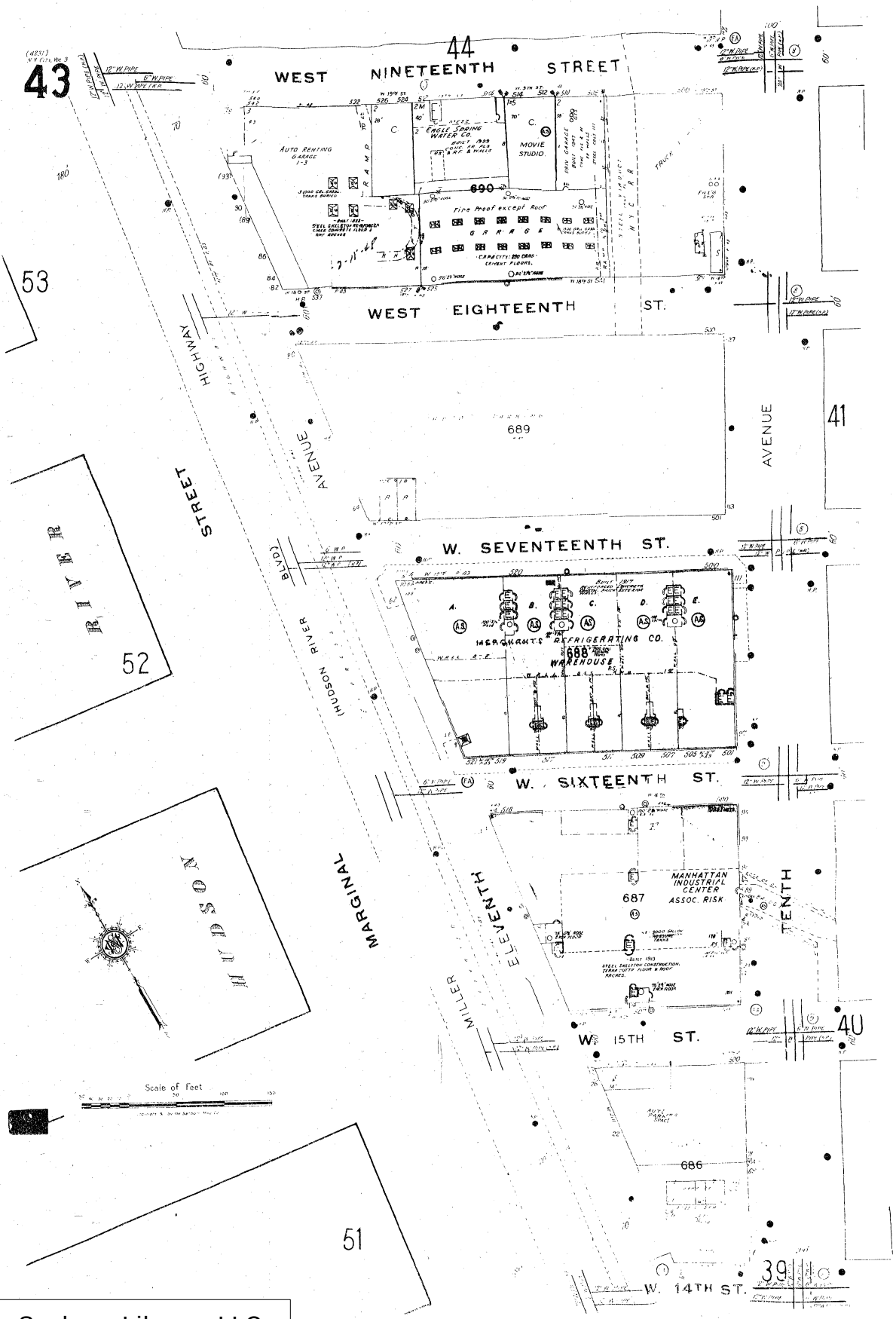


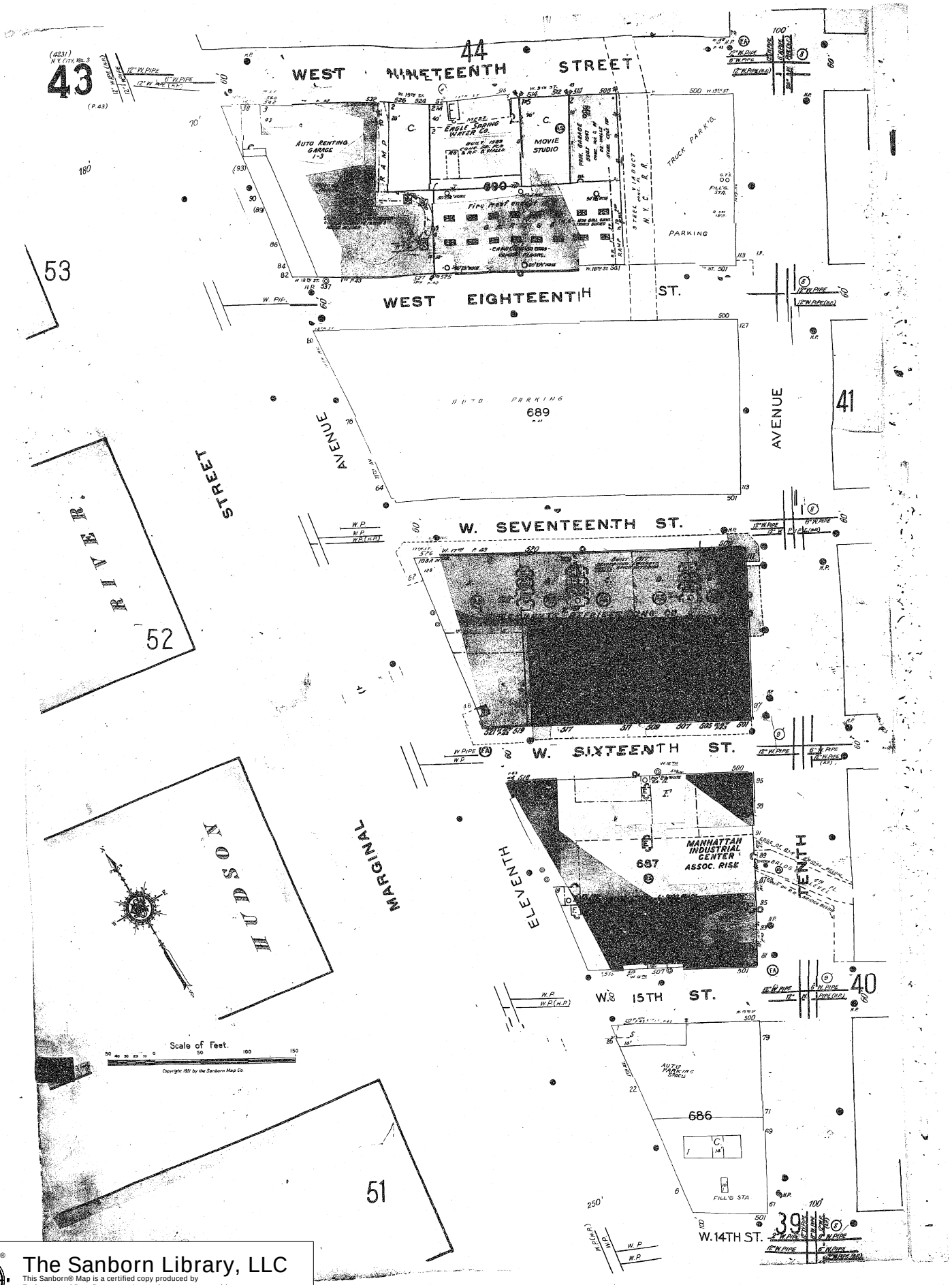


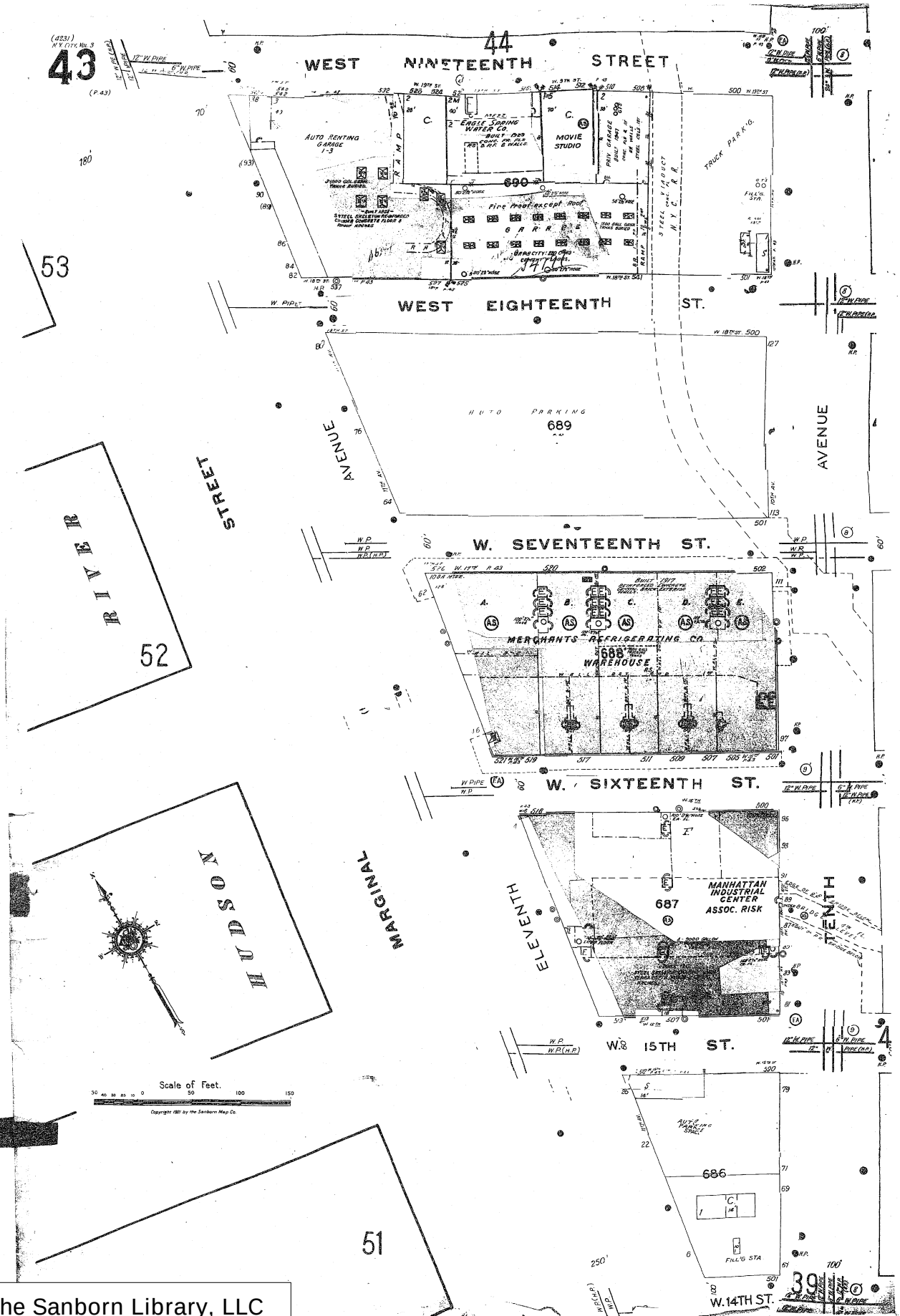


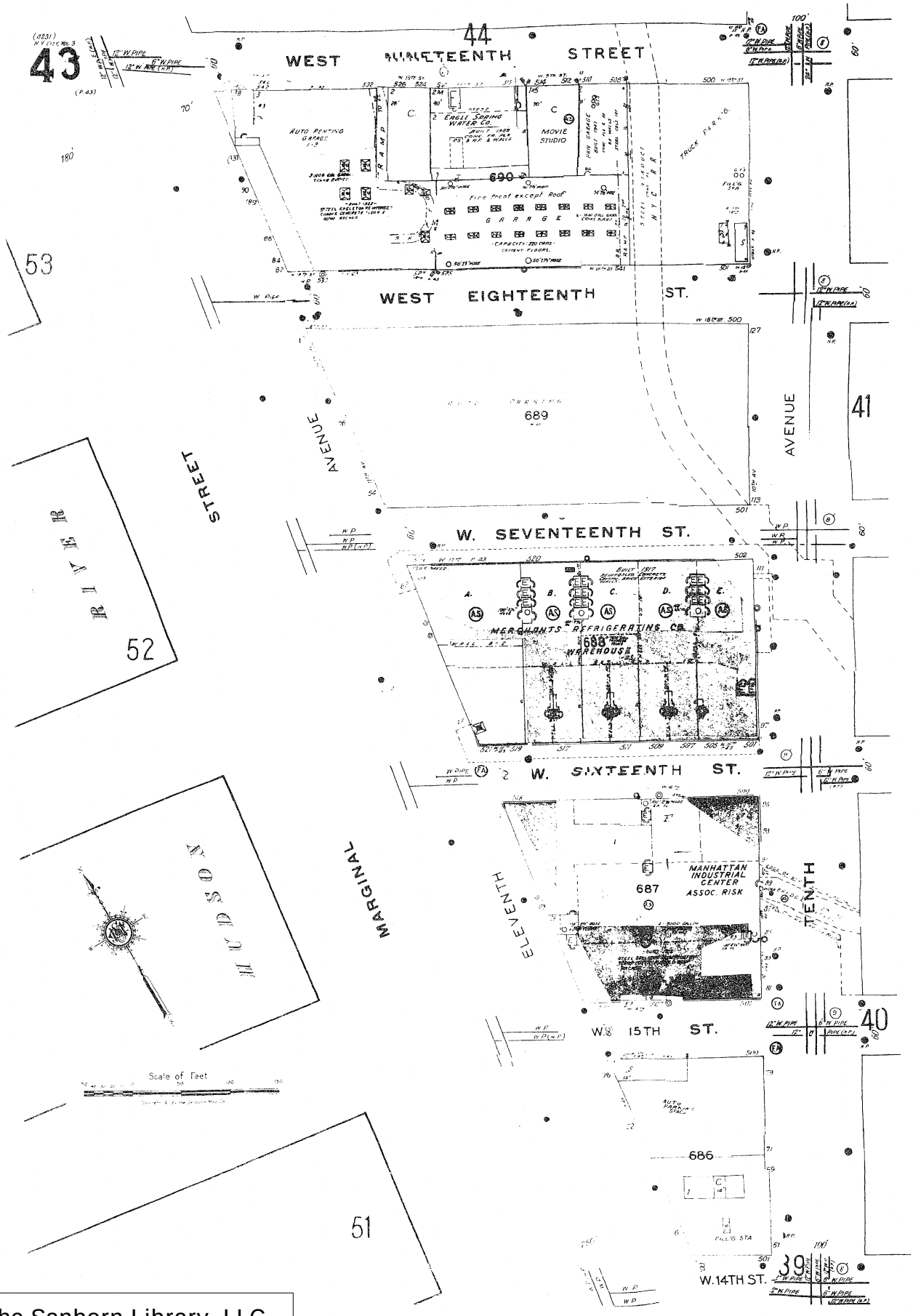


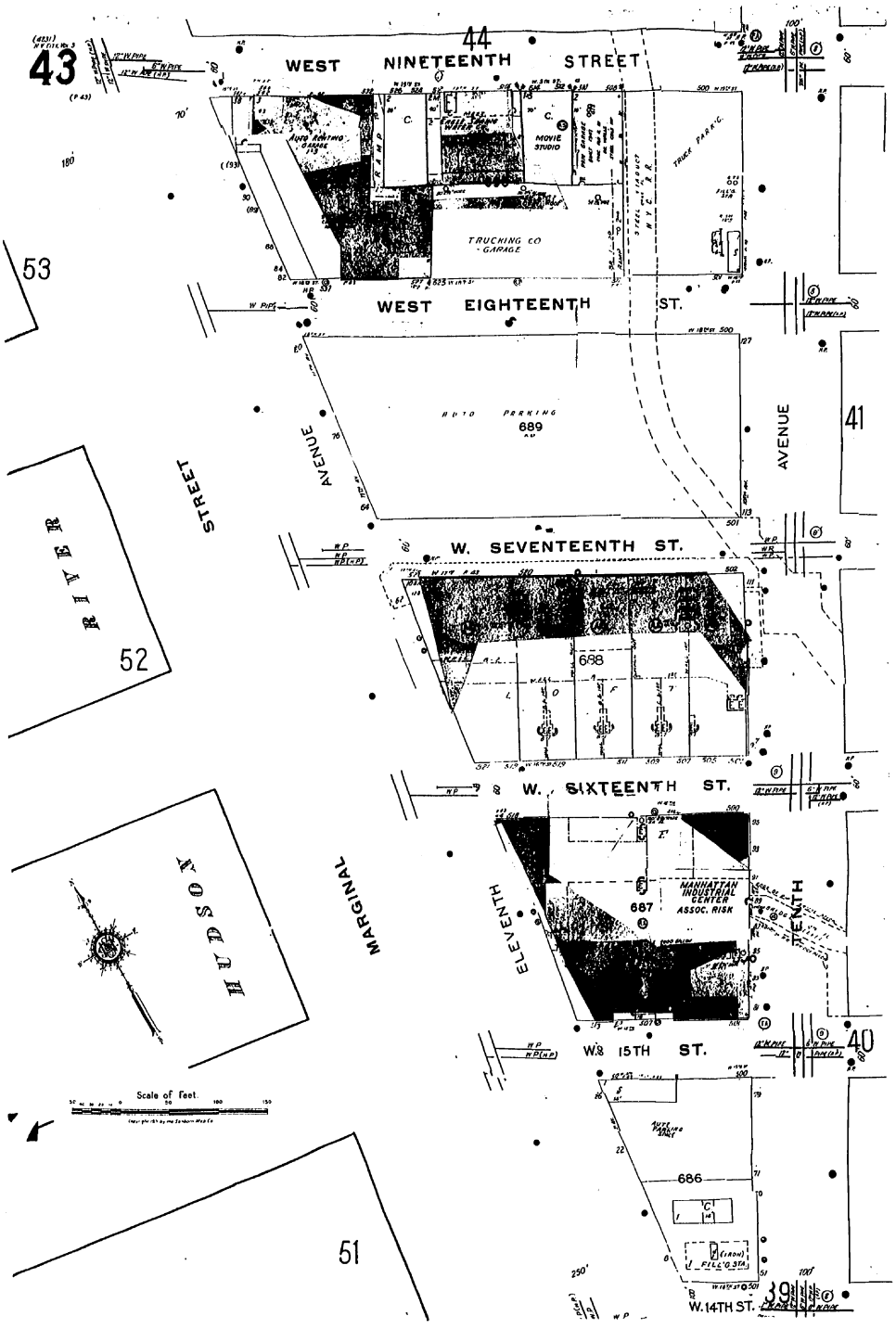


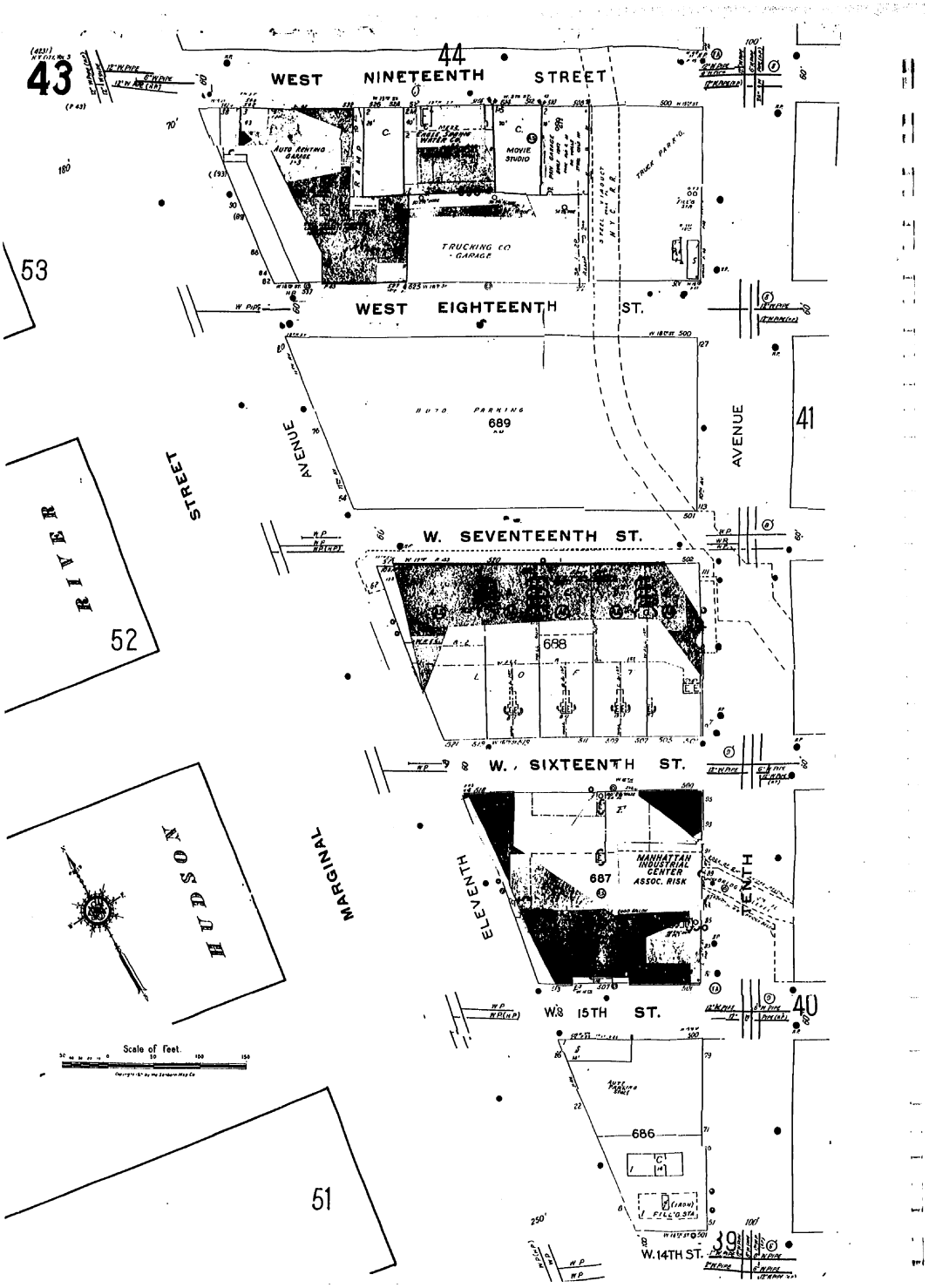


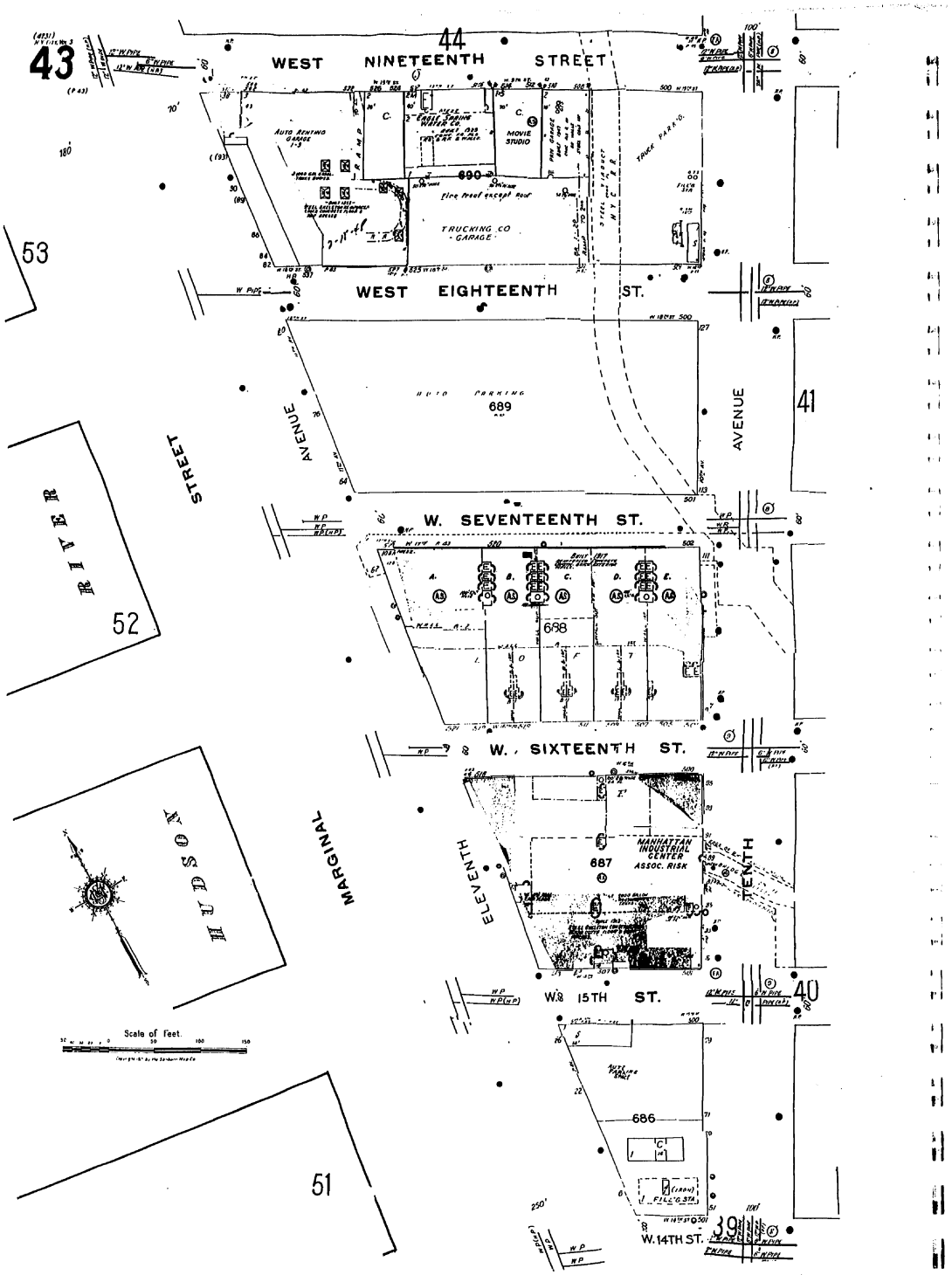


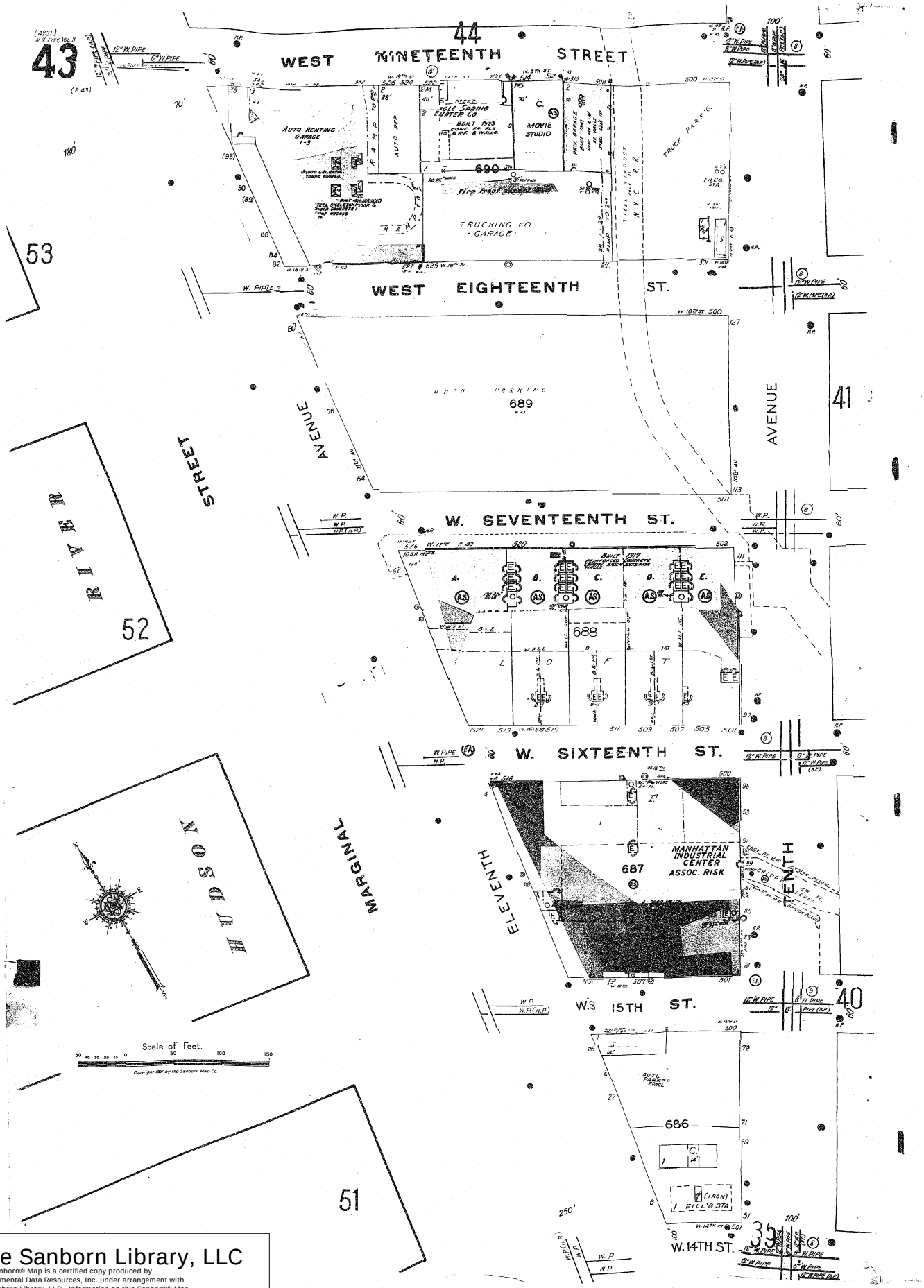


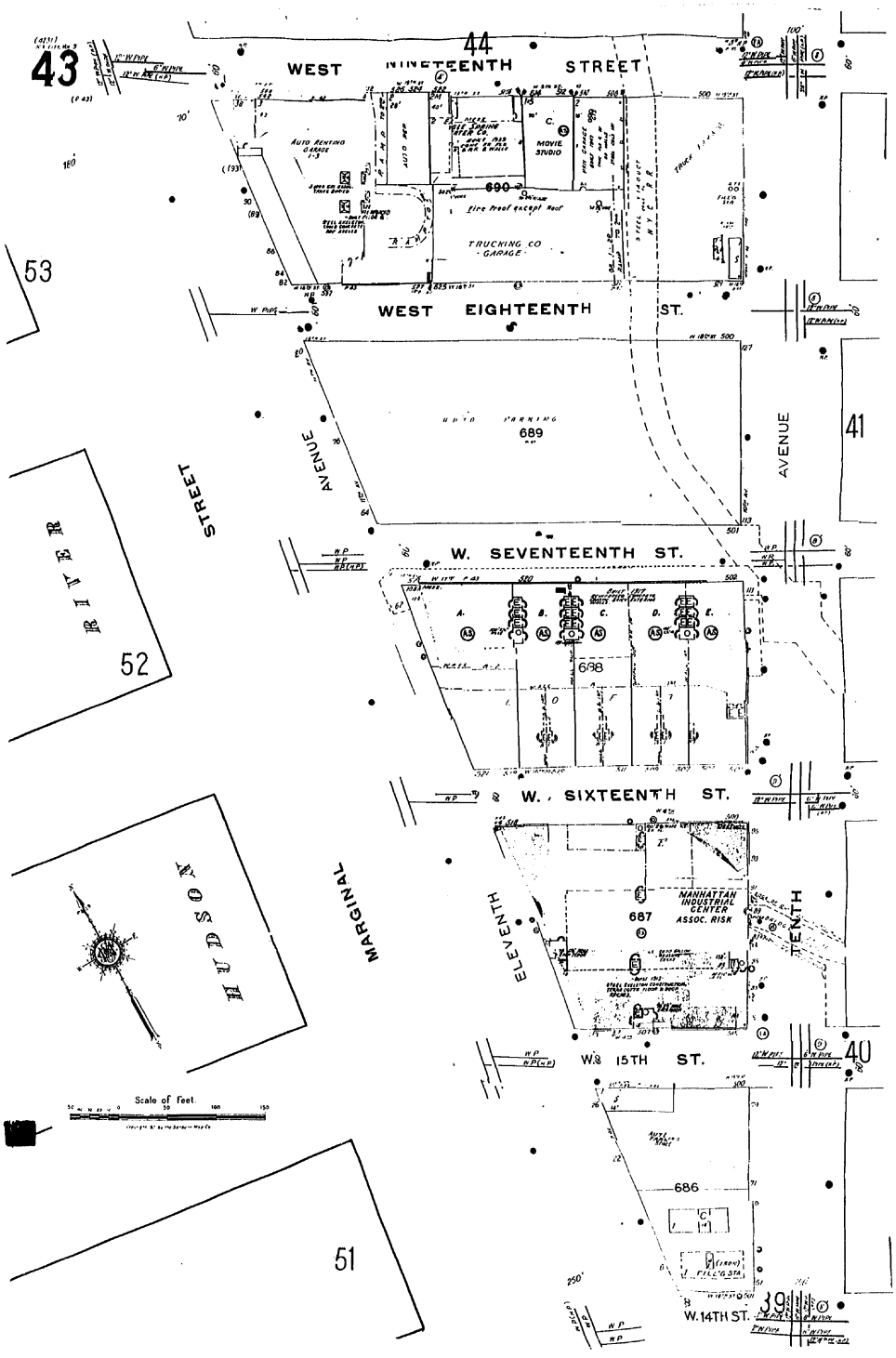


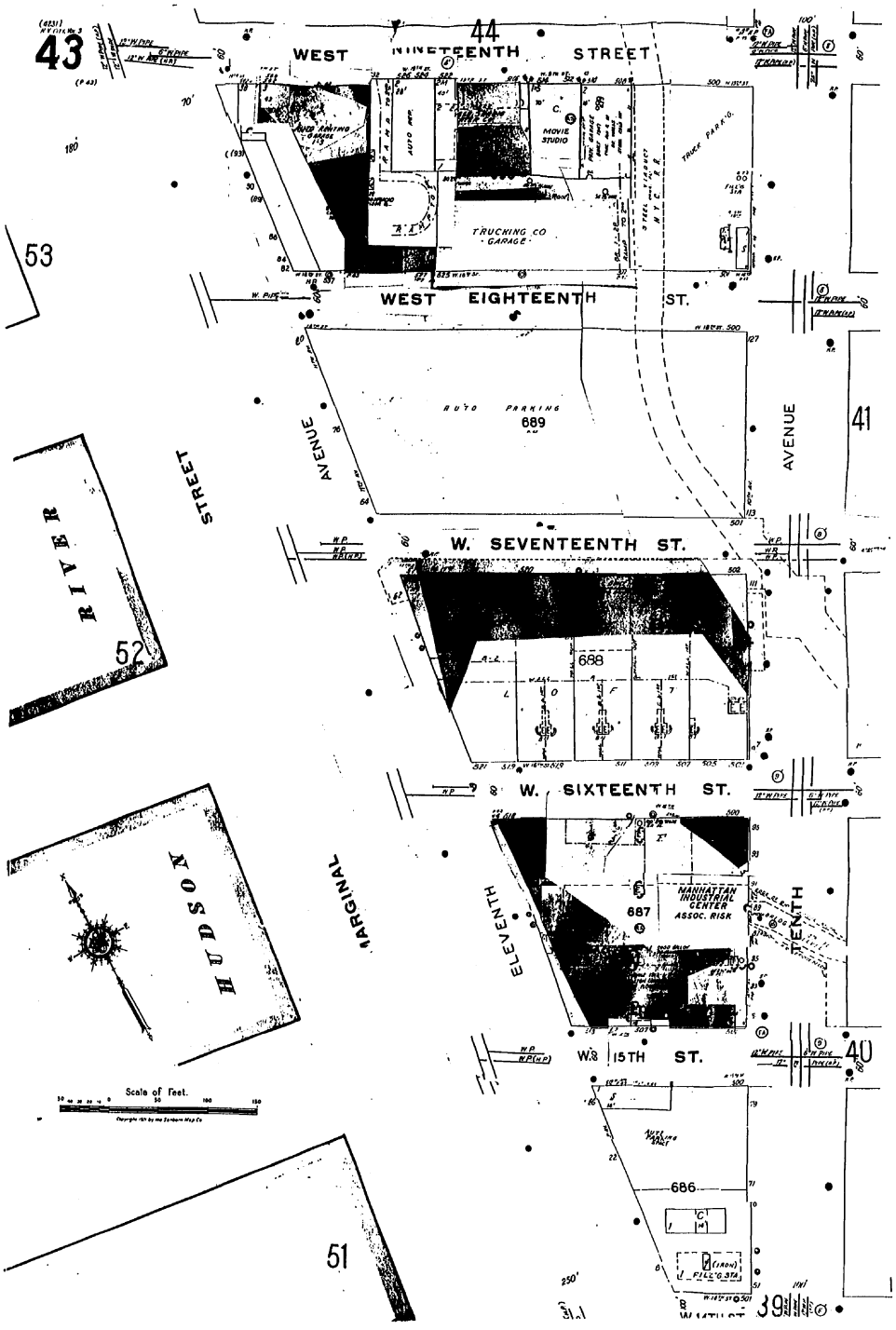












APPENDIX A

SITE PHOTOGRAPHS

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 1

Status as of: 5/15/02
Description: Block 688, SE corner (NW corner 10th Ave./W. 16th St.)
Photo by: Julie Abell Horn

Photo 2

Status as of: 5/15/02
Description: Block 688, E side (W side 10th Ave.)
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 3

Status as of: 5/15/02
Description: Block 688, SW corner (NE corner Route 9A/W. 16th St.
Photo by: Julie Abell Horn

Photo 4

Status as of: 5/15/02
Description: Chelsea Piers west of W. 16th and W. 17th Streets.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 5

Status as of: 5/15/02
Description: Chelsea Piers west of W. 17th and W. 18th Streets.
Photo by: Julie Abell Horn

Photo 6

Status as of: 5/15/02
Description: Block 688, W side (E side Route 9A).
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 7

Status as of: 5/15/02
Description: Chelsea Piers west of 18th and W. 19th Streets.
Photo by: Julie Abell Horn

Photo 8

Status as of: 5/15/02
Description: Block 688, W side (Mini Storage).
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 9

Status as of: 5/15/02
Description: Block 689, W side (parking lot).
Photo by: Julie Abell Horn

Photo 10

Status as of: 5/15/02
Description: Block 690, SW corner (NE corner Route 9A/W. 18th Street).
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 11

Status as of: 5/15/02
Description: Block 690, S side, 531 W. 18th Street warehouse.
Photo by: Julie Abell Horn

Photo 12

Status as of: 5/15/02
Description: Block 690, S side, warehourse in middle of block.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 13

Status as of: 5/15/02
Description: Block 690, S side, Roxy Club next to RR overpass.
Photo by: Julie Abell Horn

Photo 14

Status as of: 5/15/02
Description: Block 690, S side, RR overpass.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 15

Status as of: 5/15/02
Description: Block 689, E side, parking lot.
Photo by: Julie Abell Horn

Photo 16

Status as of: 5/15/02
Description: Block 689, E side
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 17

Status as of: 5/15/02
Description: Block 690, E side, parking lot (Blocks 689 and 688 in background).
Photo by: Julie Abell Horn

Photo 18

Status as of: 5/15/02
Description: Block 690, NE corner, parking lot.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000

LOCATION: 18th Street
CLIENT: Con Edison

Photo 19

Status as of: 5/15/02
Description: Block 691, SE corner, Mendon Truck Leasing, 153 10th Ave.
Photo by: Julie Abell Horn

Photo 20

Status as of: 5/15/02
Description: Block 715, N side, 456 W. 18th St. warehouse.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 21

Status as of: 5/15/02
Description: Block 715, N side, warehouse (former gas holders location).
Photo by: Julie Abell Horn

Photo 22

Status as of: 5/15/02
Description: Block 715, N side, warehouse (former gas holders location).
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 23

Status as of: 5/15/02
Description: Block 690, E side, pavement with lines of former walls embeded.
Photo by: Julie Abell Horn

Photo 24

Status as of: 5/15/02
Description: Block 691, S side, 501 W. 19th St., Mendon Truck Co..
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000

LOCATION: 18th Street
CLIENT: Con Edison

Photo 25

Status as of: 5/15/02
Description: Block 690 N side, warehouse next to RR overpass.
Photo by: Julie Abell Horn

Photo 26

Status as of: 5/15/02
Description: Block 691 S side, parkinglot next to RR overpass.

Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 27

Status as of: 5/15/02
Description: Block 691, S side, 517 W. 19th Street warehouse.
Photo by: Julie Abell Horn

Photo 28

Status as of: 5/15/02
Description: Block 690, N side, 528 W. 19th Street warehouse.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 29

Status as of: 5/15/02
Description: Block 690, N side, 516-522 W.19th Street warehouses.
Photo by: Julie Abell Horn

Photo 30

Status as of: 5/15/02
Description: Block 691, SW corner, parking lot.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 31

Status as of: 5/15/02
Description: Block 691, SW corner, parking lot.
Photo by: Julie Abell Horn

Photo 32

Status as of: 5/15/02
Description: Block 691, NW corner, 550 W. 20th Street.
Photo by: Julie Abell Horn

PROJECT: Historical Research MGP Sites
PROJECT #: 741280.04000
LOCATION: 18th Street
CLIENT: Con Edison

Photo 33

Status as of: 5/15/02
Description: Chelsea Piers, S of W 20th Street.
Photo by: Julie Abell Horn

Photo 34

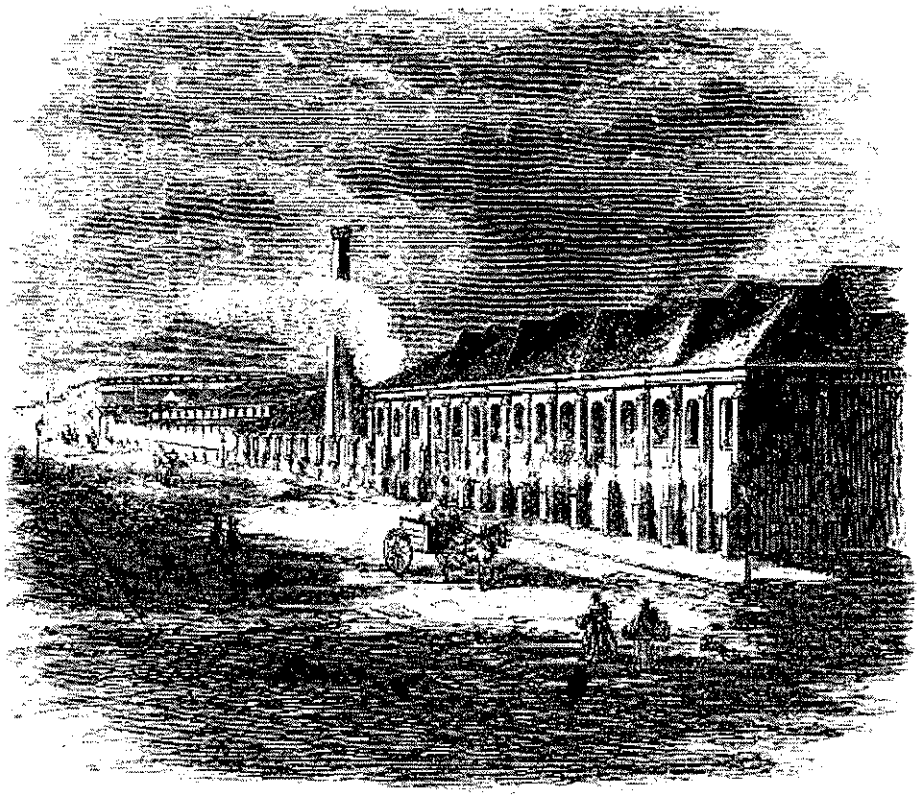
Status as of: 5/15/02
Description: Block 691, N side, oil tanks inside Mendon Truck Co. at 501 W. 19th Street.
Photo by: Julie Abell Horn

APPENDIX B

EDR REPORT

APPENDIX C

HISTORICAL PHOTOGRAPHS AND DATA



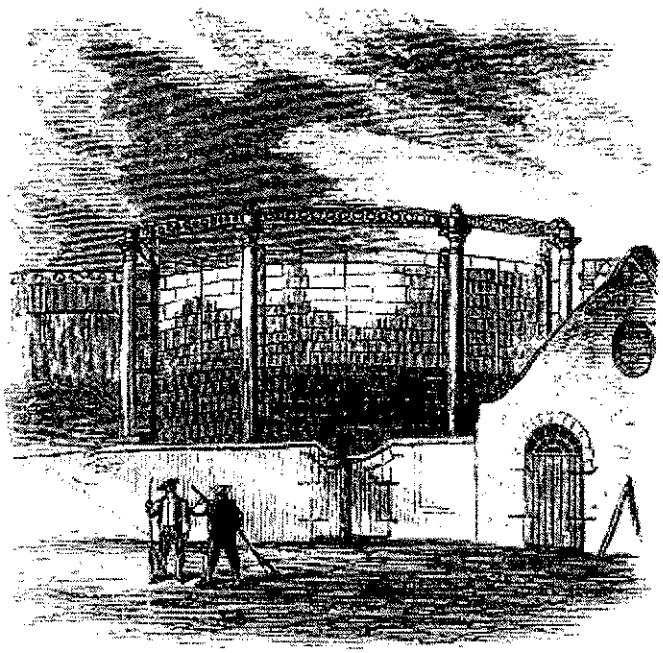
THE MANHATTAN GAS-WORKS.

GAS AND GAS-MAKING.

MY name is DAVID BIGGS—the Mr. Biggs, in fact, of whom the readers of this Magazine have before heard, and not altogether, I must acknowledge, to my advantage. When, a few months ago, my young friend Septimus Witherspoon—now my nephew by marriage—published his account of our excursion along the wharves of New York I was naturally mortified. He now owns that his representation of me was somewhat overdrawn, though he insists that it is correct in the main features. At the time when it was written—some months before it appeared in print—I was on a visit to him at his home in Herkimer County, and having ascertained that the value of the farm and railroad stocks held by his respected aunt, Deborah Jane Witherspoon, was every way satisfactory, I was paying my addresses to that estimable lady with every prospect of success. Septimus was opposed to the match, and consequently exaggerated the little aberrations which he observed in my conduct. When the article appeared in print that lady was Mrs. David Biggs. I acknowledge that I was at first attracted to her by mercenary considerations, little knowing the sterling qualities of the woman herself. If I now present myself in a more favorable character than formerly it is all owing to the influence of that noble woman. When she gave me her hand she made no paltry reservation of her estate. She put that wholly in my charge, and I am proud to say that her confidence has not been misplaced. The possession of property and the confidence of a true woman made a new man of me. The knowledge which I had acquired, especially of articles of food, came in good stead; my wife's property enabled me to turn that knowledge to account. I entered upon the business of manufacturing prepared meats, and secured a large Government contract for the supply of our army. That it has been a lucrative one is true; and there were few ladies at Rockbranch, where we passed the summer, who made a finer display than my wife. Her position as a fashionable lady was a little embarrassing at first, but that soon wore off, and I do not know when I have been more gratified than I was in reading in a New York paper a notice of "the magnificent dress and high-bred manners of Mrs. David Biggs." As for myself, I am proud to say that my credit in Wall Street is as good as that of any other man; and no one can look with more contempt than I do upon the former David Biggs, who used to wear my old boots and frequent "O'Sullivan Hall."

I am happy to say that my young friend Sep-

timus is thoroughly reconciled to our connection, and does me the favor to make my house his home when he happens to be in New York. He is a clever youth, though still a little "green," and I make it an object to post him up a little on matters and things in general, when occasion serves. Such an occasion happened not long since. A few evenings ago we were sitting in my parlor quietly sipping a cup of excellent coffee. I ought to have mentioned that, by the advice of Mrs. B., I have given up the use of brandy and other stimulants of that class. My excellent wife makes admirable coffee, after a method which I taught her, and I find it much better than my old beverages. We were sitting over our coffee when, all at once, the gas went out without a moment's warning, and left us in total darkness.



GASHOLDERS.

"What a humbug your gas is, after all, in spite of the big pots that you called gasholders, which you showed me when we took that walk along the wharves! They hold your gas now, I should think, and do not seem inclined to let you have the benefit of it," exclaimed Septimus. "I would sue the Gas Company for damages."

"Do you know any thing about gas?" I inquired.

"Certainly," he replied. "Gas, according to Worcester, is an 'aeriform fluid—a term applied to all permanently elastic fluids or airs differing from atmospheric air.' Webster's definition is to about the same purpose: 'A permanently elastic aeriform fluid, or a substance reduced to the state of an aeriform fluid by its permanent combination with caloric.'"

"That is very well," I replied; "but do you know any thing about the particular form of gas which is used in lighting our city; how it is produced, and how distributed through our streets and houses?" He acknowledged his ignorance; whereupon I inquired if he would like to learn about it. He expressed an ardent desire for information. I thereupon promised on the following day to take him through the gas-works, and to explain to him the whole process of the manufacture, adding that in the mean while I would give him a little preliminary information. I went on to explain to him that the original gases were those contained in the air we breathe—to wit, oxygen, nitrogen, and hydrogen. Farther, that oxygen and nitrogen, in a state of mechanical mixture, made atmosphere, which also contained aqueous vapor, and carbonic acid in small quantities, and near large cities certain amounts of ammonia. The more impure air is, the more the oxygen diminishes and sulphureted hydrogen and carbonic acid increase. All this, of course, was going over old matter; but still it was necessary that he might fairly understand what I was about to say farther, as I perceived he was becoming interested in the matter.

I wished to make him understand the importance of that unseeable, smellable article, generally denominated "gas," which we daily and hourly consume for the purposes of light and heat. I therefore dilated upon the immense importance of the article, and of light generally. I asked him what would the world be without light, even after sunset? I spoke of the discomfort of poking about in darkness, or going to bed at 6 P.M.

All animal and vegetable substances in combustion, I went on to say, give out light and heat. All substances of a fatty or oleaginous nature are composed of carbon and hydrogen, and when exposed to a certain heat, resolve into carbureted and bi-carbureted hydrogen or olefiant gas, which is inflammable, giving out a fine white light. All this, I said, was the simple and entire theory of gas. What improvements time will make, based upon those first principles, time will show. Pneumatic chemistry has already shown that gas can be made from water by separating the hydrogen. Some practical attempts have been made within the last two years, but without arriving as yet at any great results.

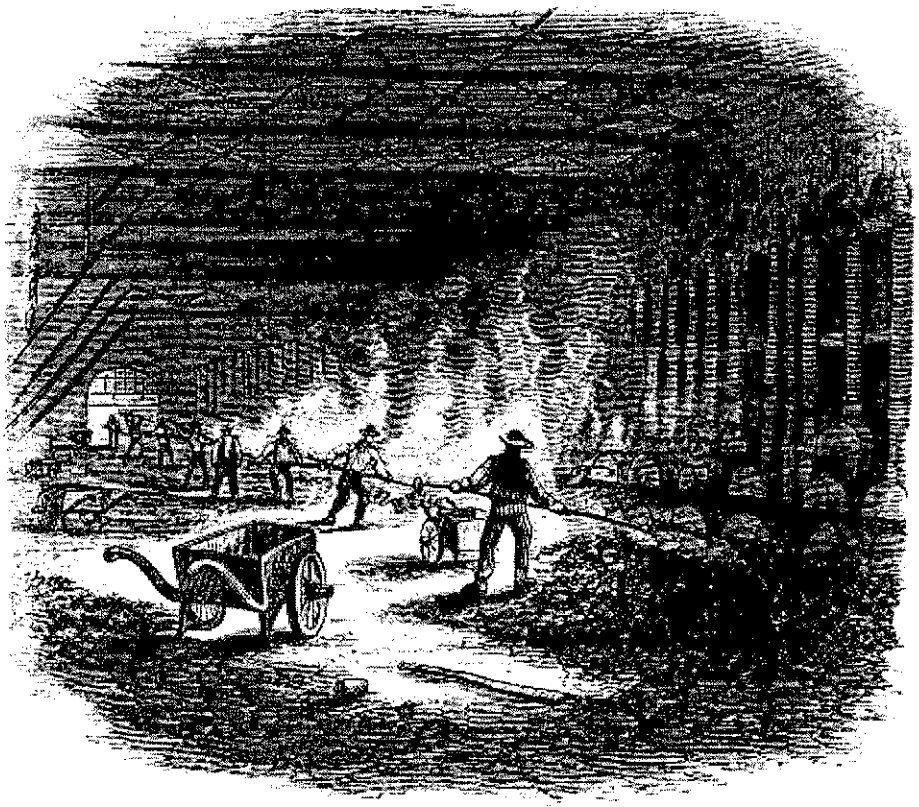
It was proposed by this method to produce gas at a cost of 48 cents per 1000 feet—rather a saving, when it is considered that we have to pay two dollars or more per 1000 feet.

It was very plain that Septimus was interested, and consequently I was determined, while my hand was in, to give him a general lesson on the subject. Under this resolve I thought it would not be a bad idea to trace the history of gas from the earliest record. To do this I did not have to go far back; for though something new turns up every day about those stern forefathers of ours, the Greeks, the Romans, and the Egyptians, yet so far it would be pretty hard to prove them the first discoverers of gas. The Chinese claim to have understood the properties of inflammable gas for centuries, and to have practically used it. The "centuries" I will not indorse; but that they have had natural gas in the neighborhood of Pekin, and possibly in other parts of the kingdom, for many years, is certainly a fact. This gas flows from the coal beds, and they claim that its use first taught them to produce the same article by art. The flowing of natural gas is no novelty, the circumstance occurring in many places in England and on the continent of Europe. In this country the most marked instances are the lighting of the town of Fredonia, in the State of New York, and of the light-house and other buildings at Portland, on Lake Erie. In the record of the transactions of the Royal Society for 1667, this flowing and burning of natural gas is mentioned as occurring at Wigan, in Lancashire. It has long ceased to be a novelty, being a case of constant occurrence in any coal district while boring for wells.

"But your gas," interrupted Septimus, "I mean that which left us in darkness a few minutes ago, isn't natural gas. I happened the other day into a big building where a lot of stout fellows were shoveling coals into a row of ovens. I asked them what they were doing, and they said they were making gas. I took a sketch of the place, and here it is."

"Very good," I replied; "you saw only one part of the process of making gas; a very complicated operation it is too, as you will find to-morrow, when you come to see it. Now while I am posting you up a little beforehand about the history of gas and gas-making, don't you go to sleep, as you did when I was telling you about the commercial history of New York. I don't like people to go to sleep when I am talking to them."

Septimus laughed, for that little episode in our former journey has got to be a standing joke between us. Mrs. Biggs looked a little sour, for that excellent woman is somewhat tender upon the subject of my former way of life.



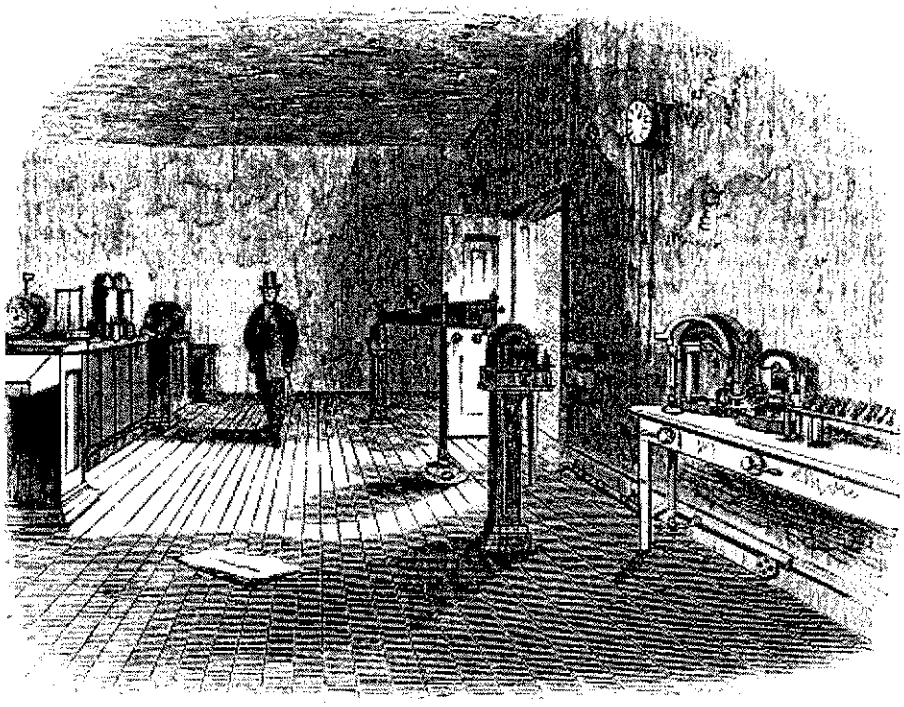
MAKING GAS.

In 1726, I continued, referring to a memorandum, which I happened to have in my pocket, Dr. Hales published a work on Vegetable Statics, in which he gives the result of some experiments in producing coal gas. He states that he made 180 cubic inches of gas from 158 grains of coal. In 1733 the Rev. John Clayton first brought the matter into tangible shape by experiments, and by sending bladders containing specimens of gas to the Royal Society. In 1739 there is entered upon the records of the Society his account of the first discovery. He says, after putting some coal in the retort: "At first there came over only phlegm, afterward a black oil, and then likewise a spirit arose which I could nowise condense. I observed that the spirit which issued out caught fire at the flame of a candle, and continued burning with violence as it issued out in a stream, which I blew out and lighted again several times." Weighing all this, I gave it as my opinion that the Rev. John Clayton was the first real discoverer of inflammable gas.

After this I told my young friend of the practical adaptation of it. How Mr. Murdoch, of Redruth, in Cornwall, exhibited it publicly, and afterward lighted the foundry of Messrs. Boulton and Watt—famous as connected with the origin of steam-engines—with it in 1802. From that time the march was rather rapid. In 1804 the Lyceum Theatre of London was lighted with it. In 1813 Westminster Bridge used it with great success, and the following year the entire of Westminster adopted the new light. Two years later the city of London fell into the line, and its streets blazed with the wickless lamps. Up to this time the ignorance of the properties of gas did not lie alone with the vulgar. It extended into high places, even to the making of scientific men oppose its introduction. It is told that, in the year 1813, when the first attempt was made to light the Houses of Parliament, the noble lords and gentlemen commoners would put their hands timidly on the pipes and express their astonishment that they were not hot. The architect of the building also insisted that five inches space should be left between the wood-work and the supposed fiery pipes.

And now, to show that our own land was not behind in the struggle for light, I went on to say how, in 1815, Mr. James M'Murtrie moved in the Philadelphia city councils for the appointment of a committee to inquire into the expediency of lighting that place with gas. The next year Baltimore commenced the experiment, she being the first city in the United States making and using the article. Boston followed suit in 1822, and in 1823 several other cities did the same, including New York, which commenced by incorporating the New York Gas Company with a capital of $1,000,000, though the actual lighting did not occur until 1825. In 1830 the Manhattan Gas Company was incorporated with a capital of $500,000, which has since been increased to $4,000,000. At the present day the gas stock of the United States represents the total sum of $50,000,000, embraced in over three hundred companies. The price of gas to the con-

THE LABORATORY.



THE PHOTOMETER ROOM.

sumer varies according to the nearness of a city to the coal districts, as well as by the quantity they manufacture, the largest makers, of course, affording it at a more reduced rate than the small towns. Pittsburg is undoubtedly the lowest, charging but $1 80 per 1000 feet, while Auburn and Watertown, New York, Belfast, Maine, and Charlotte, North Carolina, are the dearest; all these places charging $7 00 per 1000 feet. New York, Boston, and Cincinnati give the consumer the pure thing for $2 50 per 1000 feet. Philadelphia charges $2 13; Chicago, $3 50; Troy, $3 60; St. Louis, $3 50, and Richmond, Virginia, $2 85. The city of London charges six shillings ($1 40) per 1000 feet. I read these statistics from a memorandum which I had made a year or two before, but I thought the figures were about the same now.

There are, I continued, two gas-houses in the city, or rather two companies, one of which, the Manhattan, has three places of manufacture; the first at Sixty-fifth Street, North River, the second at Eighteenth Street, North River, and the third at Fourteenth Street, East River. This company has for its district all the city from the north side of Grand Street to the south side of Seventy-ninth Street. Within this territory they have 230 miles of cast-iron main laid, employ 1500 men, and serve 30,000 customers. The other company—the New York—has one place of manufacture at the foot of Twenty-first and Twenty-second streets, their district being all the city south of Grand Street. They have 180 miles of cast-iron main laid, and serve 11,000 customers. Besides these, there is a company in Harlem, which supplies the gas for the part of the city above Seventy-ninth Street.

This preliminary information having been given, I told my nephew that I was the fortunate owner of a number of shares in the Manhattan, bought with a part of his excellent aunt's money. "And a most capital investment too, my dear," I added to my wife, "if this foolish movement for increasing the price of the gas on account of the war-tax does not lead the Legislature to annul our privileges. We were making money enough to enable us to submit to the tax ourselves, and furnish gas at the old price. Better let well enough alone. But we shall see what we shall see."

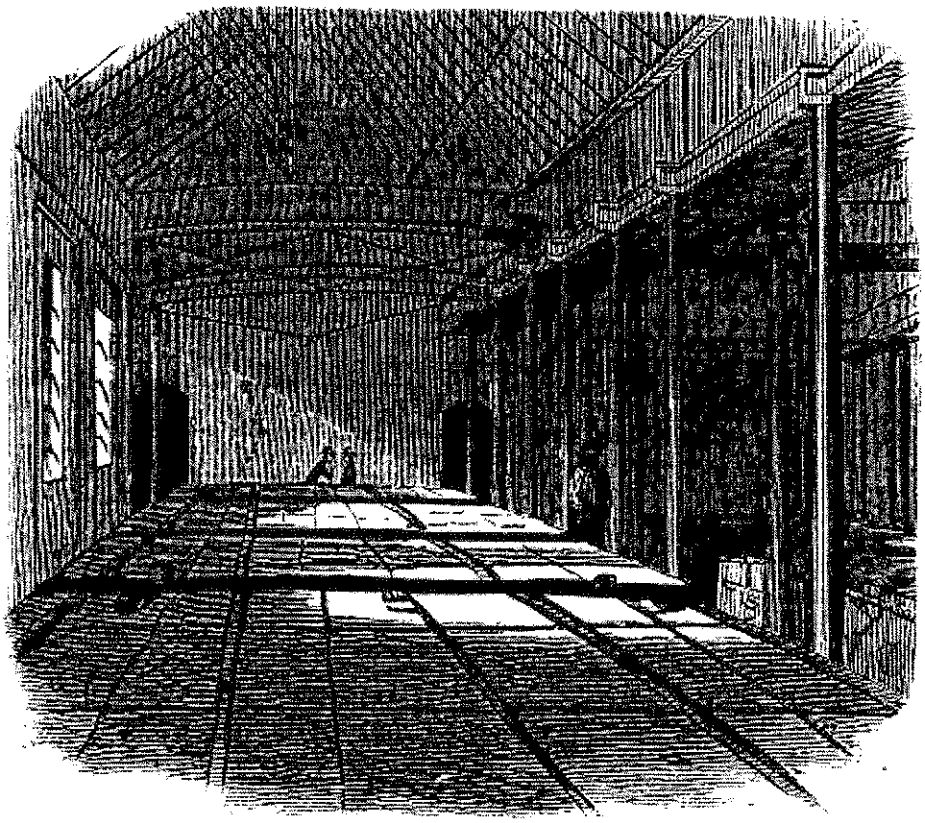
As I knew personally the chief engineer, I was sure he would show us over the works; and so next day we would pay them a visit. Thither we proceeded on the following morning, and found my friend the engineer at leisure to conduct us over the works. He seemed to think we had done him a personal favor by the visit. He is sure of my vote for his continuance in the place.

The first room into which we were introduced was the draughting-room—the spot where all the plans, elevations, maps, and general work of an architectural or topographical nature is executed. This room, though entirely essential to the works, not coming strictly under the head of gas, did not elicit my young friend's admiration.

Through this to what the engineer terms "The Laboratory"—an apartment of about twen-

ty-five feet square, scrupulously clean and solemnly in order, wherein all the experiments are made of testing, improving, altering, and mixing. Shelves with numberless glass-stoppered vials fill one side of it, and well-polished and painted bits of gas machinery loom up through the floor. From this room, like a passage from life to death, we enter upon the "Photometer Room"—a tomb-like, dismal apartment, dedicated to the purpose of testing the strength of gas by candle-power. The walls and ceiling were, as a Milesian gentleman would express it, whitewashed black, that effect being produced with lampblack and turpentine to prevent any reflection of light. The shutters closed without a seam to admit even a twinkle, and there in the blackest of darkness we were. Out of this darkness came the voice of the engineer laying down the rules by which the strength of gas is judged as compared with a candle of sperm or wax. The practical portion was shown by lighting a gas jet at one end of a frame standing in the centre of the room, and a candle on the other end of the same frame. The gas coming through this jet is made, by means of a regulator, to burn at the uniform rate of 5 cubic feet per hour. On a slide, running exactly in a line between candle and gas jet, which are 100 inches apart, is a round frame on which is stretched paper, oiled all but a small circular spot in the centre, which is left plain. When this frame is midway between gas and candle, the plain spot is easily seen on the candle side, the gas being the stronger light. As it is brought along the slide nearer the candle this clear spot disappears, until at a certain point both sides of the paper will look alike, the light being equalized. This slide is marked into certain divisions and numbered, by which the actual strength of the gas is known, as compared with the candle. With this instrument the engineer is enabled to tell to a nicety the article he is giving the public, and to give it them at a uniform strength of fifteen candles for each burner when consuming at the rate of 5 cubic feet per hour. It is, as Septimus very nicely observed, the "Tasting Room," where, after the company has cooked up a nice potful of their favorite fluid, they help themselves to a spoonful or two to see how it will suit the palate.

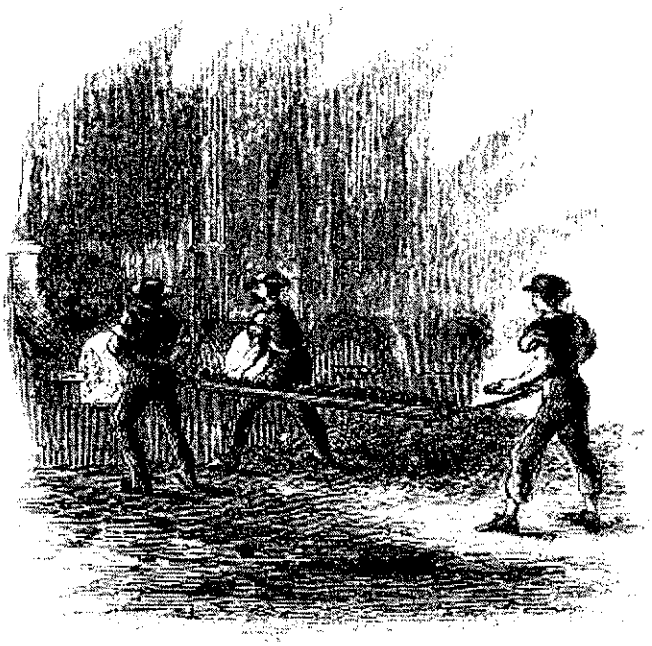
Just below the Photometer Room, on the ground-floor, is another pleasant little playhouse, where a perfect machine for the manufacture of gas is set up, on a miniature scale, for the purpose of testing coal, or completing any experiments for which the great works would not be suitable. It is in this room that all gas-making products are tried, especially such coal



THE RETORT HOUSE.

as may be offered to the company, and its relative value found out.

Once more, and again, besides this miniature gas-house is another of a like style, but of larger dimensions, also for testing coal, and for rougher and larger experimental purposes. This is merely the great works on a reduced scale, the machinery being identical, and the retort exactly the same as that used for ordinary manufacturing.—This small gas-works has a capacity for turning out 4500 feet per twenty-four hours, almost enough in itself to light up a small town.



FILLING A RETORT.

At the moment that we were about to emerge from the infantine into the parent works, I saw a look of indecision upon the face of Septimus and a halting movement. I saw him take the arm of the chief engineer, and draw him gently aside as he whispered a word or two in his ear. I saw the engineer raise his eyes with a slightly-astonished look, and I felt morally certain that my young friend had been saying something ridiculous.

"Danger! Why, my dear Sir," says the engineer, "we never have any accidents happen here. You are quite as safe as you would be in your own house."

Septimus looked rather foolish, and immediately said to the engineer that the danger he apprehended was not so much to life and limb as a desire to know whether the inhalation of gas was not calculated to destroy the sanitory equilibrium. A slight smile from the engineer, and a search through some documents which he drew from an inside pocket, I think, settled that matter to my companion's satisfaction. The clencher was the "Extract of a Report of the State Medical Society of Pennsylvania, held at Philadelphia May 29, 1851:"

"Reports from the various districts of the city were read, but they presented nothing new except the following:

"'The Gas Manufacturing Company of the District of the Northern Liberties has greatly improved the health of the neighborhood in which it is located, which was the lowest and most unhealthy part of the district. The residents there had previously been unusually subject to dysentery and autumnal fevers; and during the cholera season of 1832, previous to the erection of the gas-works, the disease was more prevalent and fatal than in any other part of the district. During the last epidemic not a case of cholera occurred in the neighborhood, and dysentery and autumnal fever have entirely disappeared. The Superintendent further states that several persons afflicted with pulmonary complaints have been employed at the gas-works, and have become perfectly well.'"

There was of course nothing to be said now by Septimus about entering on the main works, and the engineer consequently ushered us into the Retort House. In this building were 1000 retorts, the company using in all 2000 retorts. This retort is similar to one half a pipe, cut lengthwise, and shut up at one end. It is made of clay, the experience of the last few years proving this article superior to iron in wear as well as in other minor requisites. These retorts have heretofore been manufactured at Ghent (in Belgium) and in England; but we are now getting them up at several places in this country in a satisfactory way, the most perfect of which is the Ohio and Jersey City make. A properly made retort will last two years.

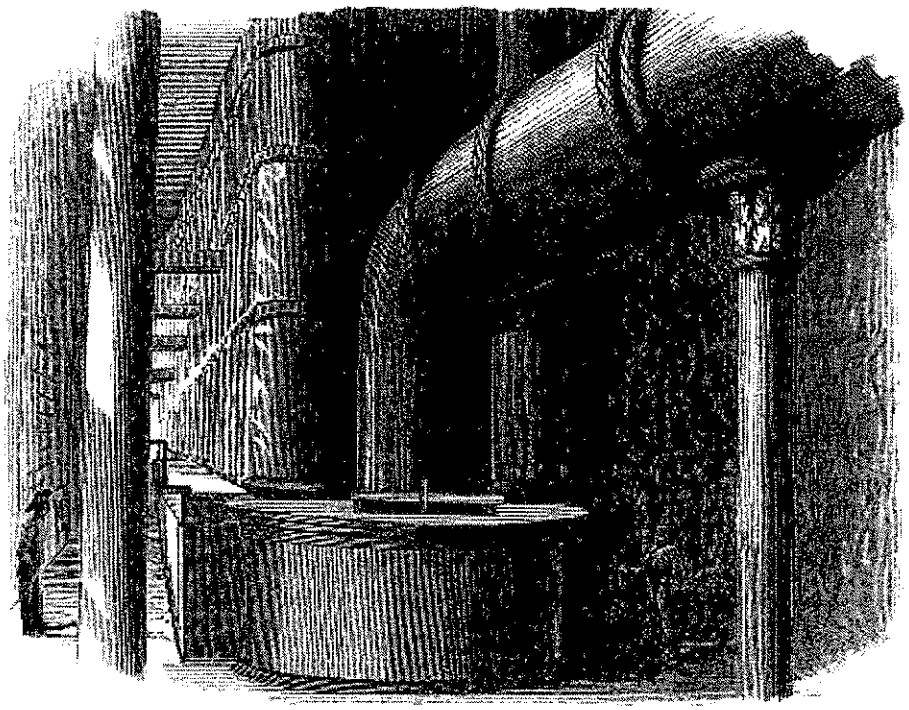
After the coal has been thoroughly tested and become dry it is mixed in equal quantities of American and English for use. These retorts are set in a frame-work of brick, with the open end outward, pretty much like the mouth of an old-fashioned oven. The fire, which is lighted below, burns entirely around them with a fierce heat. Into these retorts the coal is put by gangs of stalwart men, who play about in the fire like salamanders, seeming really to enjoy the burning. Three men are assigned to each bench of retorts—a bench consisting of fifteen—which bench they are expected to manage entirely, but not to sit down on. The charging, or filling, of these retorts is a piece of work that must not only be done skillfully, but it must be executed with great rapidity, that no more gas may escape and be wasted than is absolutely necessary. To work this quickly a shovel, or scoop, is made which holds 110 pounds of coal: two of these

scoops stand ready filled, and as soon as the retort is cleared from the coke it contains the scoops are run in, emptied, and the lid again clapped on, and fastened so tightly that no gas can find its way out. These charges remain in five hours, and the time consumed in changing and charging a bench of retorts is fifteen minutes. After all the gas is extracted the coke, which remains in the form of carbon, is an excellent fuel. One half the quantity produced is used in the works for heating the retorts, or other purposes; the other half is sold. The increase in bulk, in the change from coal to coke, is about 100 per cent., but, of course, with a great diminution in weight.

DRAWING A CHARGE.

Septimus was delighted with the simplicity of the operation, and seemed to incline to the belief that, with a stone jar and a charcoal furnace—such as he felt sure I could furnish him from the household stock—he could light up my dwelling beautifully, and be no longer dependent on the company. I think about this time that the engineer took him down a foot or two by saying,

WETTING COAL.



THE CONDENSER.

"Now we have the gas, to be sure, but in a very crude, bad state, and unfit for burning. As it is, it would not flow through the pipes; and if it did, would burn black and smoky, keeping the air continually full of flying specks. We must work it up a little yet—condense it and purify it—wash it, and make it generally fit to offer an intelligent and cleanly public. To do this, the gas is led away by pipes to the Condensers. The object is to rid it of the tar; and to do this we must pass it through pipes surrounded by water. Through the pipes it travels almost an endless road, up one pipe and down another, until, disgusted with its tarry condition, it gives up that portion of its impurity, and dodges out of the condenser."

I thought by this time, looking at my young friend, that he did not seem so anxious to enter upon experimental gas-making; his ardor cooled under the condenser. The engineer resumed:

"Not so fast, though! we're not done with the article yet. It is not so clean that it may show its face unblushingly to the public. The more ignorant portion of the people still have their prejudices alive about their good friend 'Gas;' and for that reason it would be as well to make him as presentable as possible. It has been a hard fight to give him position in the face of prejudice and error, and it is only within a few years that the most fearful stories of gas have ceased to be retailed. In England the introduction was attended with determined opposition, and nothing but the most positive evidence of its wonderful effect could have prevailed against the loads of ignorance that sought to crush it. In 1823 forty witnesses were examined before a committee of the House of Commons, every one of whom testified against gas. Some declared that it had affected their throats and those of their family; others that it had produced disease of different forms; some that it had spoiled their clothes and ruined their furniture; and, in fact, no charge that could be thought of, having the slightest semblance to possibility, but was brought. In spite of all this the report was in its favor, and our useful friend forced his way against all slander. In 1814, on the occasion of the illuminations and festivities for the declaration of peace, a most unfortunate affair occurred for the character of gas. Mr. Clegg, the great gas engineer, had put up a magnificent pagoda in Hyde Park to illuminate, when Sir William Congreve, of rocket celebrity, undertook to set off fire-works from the top, just previous to the illumination, by which he set the pagoda on fire and destroyed it. The accident, of course, was laid to the gas.

"It has been the same in this country even as late as within ten years, though if we go back a quarter of a century we can remember many of the most terrible stories that ever were told to a scape-grace child put forth as actual facts in the battle against gas. In 1833 Mr. S. V. Merrick, of Philadelphia, one of the originators and stoutest advocates of the new light, opened a correspondence with the Mayors of the different cities where gas-works were in operation, and with the presidents of different insurance companies,

as well as with such persons as had become any way experienced in its use, for the purpose of showing by the publication that gas was more healthy, more economical, safer, and in every way better than oil. He certainly succeeded as far as common-sense can succeed against prejudice and interested ignorance. In this very year the city gas-lighting movement had made so strong a head that the oil-men began to feel it in a vital spot—the pocket. As a sort of counter action—a Mrs. Partington effort to brush back the sea with a broom—the great dealers in oil at New Bedford and other places to the eastward sent out agents offering to light various cities, where gas had already been introduced, with oil, charging at the rate of 80 cents per gallon when the market price ruled at $1 02½. In spite of all this new companies were organized in various parts of the United States, and every day added to the new improvements and to the profits."

Septimus here broke in to ask about explosions—a question that showed in a moment a lingering memory of those past days when we were entertained by old women with stories of the terrible effects that would ensue should the gas-house take fire. Nothing less was foretold in such case than the entire destruction of the city by an indiscriminate bursting of pipes every where. The engineer soon set all that right by showing that such a thing as an explosion could not occur unless by an escape of gas and an equal admixture with oxygen. When this occurs, and the gas has no chance to escape into open space, the contact with a light will cause an explosion. Fatal accidents have occurred from this cause, as fatal accidents will always occur where ignorant or careless people are. There can be no doubt whatever that the occurrence of accidents from lamps and candles far exceeded those that have arisen from gas. The stationary light must certainly be an immense point gained over those that could be carried into dangerous places, when the mere question of accidents from fire is taken into consideration.

To go back to the condenser—the merit of which invention belongs, as I went on to explain to my nephew, aided now and then by a hint from the engineer, to Dr. Watson, Bishop of Llandaff, who was the first to discover and make public the fact that gas retained its inflammable quality after passing through water. He gave the world the benefit of his discovery in his "Chemical Essays," published in 1760. We follow the gas after its purification from tar. The next move upon the board is to take from our friend the elements that do not tend to his improvement as an inflammable article. The first of these separations necessary to be made is a divorce from ammonia—an article that exists in considerable quantities, diminishing the illuminating power and injuring the pipes and meters. To accomplish this Mr. Gas is conducted gently into a vessel denominated a "Washer," where he passes through water, under water, over water, and has water thrown on him by a fountain-like stream that continually plays

THE PURIFIER.

THE VALVE ROOM.

through the vessel. This washer is a circular tank constructed with reference to the action of the water upon every particle of gas. The ammonia having an affinity for water becomes easily separated, and flows out in the form of ammoniacal liquor.

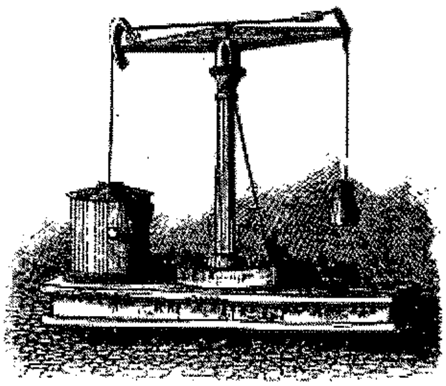
By this plan from eight to ten gallons of this strong-smelling fluid are extracted from the gas produced from one ton of coal, which, with the same quantity of tar gathered from the same gas by the efforts of the condenser, goes somewhat toward the expense of making our friend clean and presentable. This process of separating the ammonia is the invention of Mr. Croll, an English gas engineer of great reputation. The tar is used for various mechanical purposes of value, such as the making of naphtha, carbo-naphtha, carboline oil, burning fluid, tar oil, and asphalte; and the ammoniacal liquor goes into the hands of manufacturing chemists, who extract about fourteen ounces of sulphate of ammonia from each gallon of the liquor. Chloride of ammonium, or sal-ammoniac, which formerly was only to be obtained from the excrement of the camel, is now made from this same liquid.

The gas having now been discharged from the washer, much, as I think, to the satisfaction of Septimus, who was, I am inclined to believe, fearful lest it should become mixed with the water, is forced to find its way to the "Purifier." This is an iron box or tank intended to remove the sulphur still remaining in the gas, and interfering with its good properties. The purifier contains several tiers of trays or sieves, separated from each other, and held by a projection on the inside of the box or tank. In each of these trays is spread powdered lime slightly damped. The gas is introduced at the bottom of the tank, and is forced upward through this powdered lime, which has the effect of seizing upon the sulphur and turning out the gas as pure as human ingenuity has so far been enabled to make it; while the refuse lime, when no longer fit for purifying, is sold for the purposes of manure. The component parts of the gas now are, olefiant gas, hydrocarbon vapor, hydrogen, light carbureted hydrogen, carbonic oxide, and a small portion of nitrogen.

"And now," says Septimus, "the gas is made, let's go home and get something to eat."

I could not help expressing a slight symptom of disgust at my young friend. How could I when the circumstances of our visit were taken into consideration? It was for his instruction that I had come, and now he allowed "something to eat" a place of greater importance than mental food. I was glad, however, to see that the engineer did not mind it, merely smiling upon the dereliet Herkimerian, and saying:

"Yes, the gas is now made, but there is yet the labor of keeping it and of distributing it. Experience has taught us that it is as necessary that we should keep a stock on hand as that a shop-keeper should have goods to sell. Our sixteen gasholders are not a bit too much for our stock on hand, though the largest are 75 feet in diameter by 60 feet in height; these gas-



THE GOVERNOR.

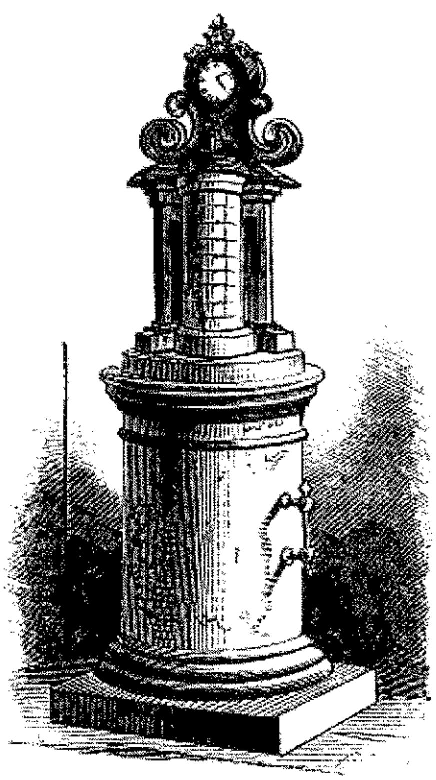
holders are capable of containing from 250,000 to 500,000 feet. This is now the ordinary capacity of the gasholder, though in the year 1814 a deputation of the Royal Society, headed by the great Sir Joseph Banks, after visiting the works of the Westminster Company, advised Government to restrict them to 6000 feet in capacity, as an increase on that size would be attended with great danger. There is now one at Philadelphia capable of containing 1,000,000 feet."

The gasholder is a large inverted iron pot slung from a frame-work of iron. The inversion is made in a tank built of brick and kept filled with water. It is in fact only our childhood's trick of the tumbler inverted on a saucer of water and filled with smoke. This holder is constructed of plates of iron, riveted together, the seams at the time of riveting being filled with a composition rendering them infallibly gas-tight. They have of course no bottom, the gas being introduced by a pipe leading up above the surface of the water, while the outlet is similar. This great iron pot is suspended to the frame by chains, which run over wheels, having attached to the other end sufficient weight to balance the holder and allow it to rise gently as the gas enters, or fall as the gas goes out. The pressure requisite to raise this huge mass of iron is equal to the raising of water five inches in the tube. In the midst of the group of gasholders stands a small building, "the Valve Room," where at a glance can be seen the quantity that has gone into each holder, and as soon as sufficient has entered the valve is closed and the supply directed to another holder. In winter it is necessary to prevent the water in these tanks from freezing: this end is achieved by pouring tar into the space between the inner side of the tank and the outer side of the holder to the depth of a couple of inches.

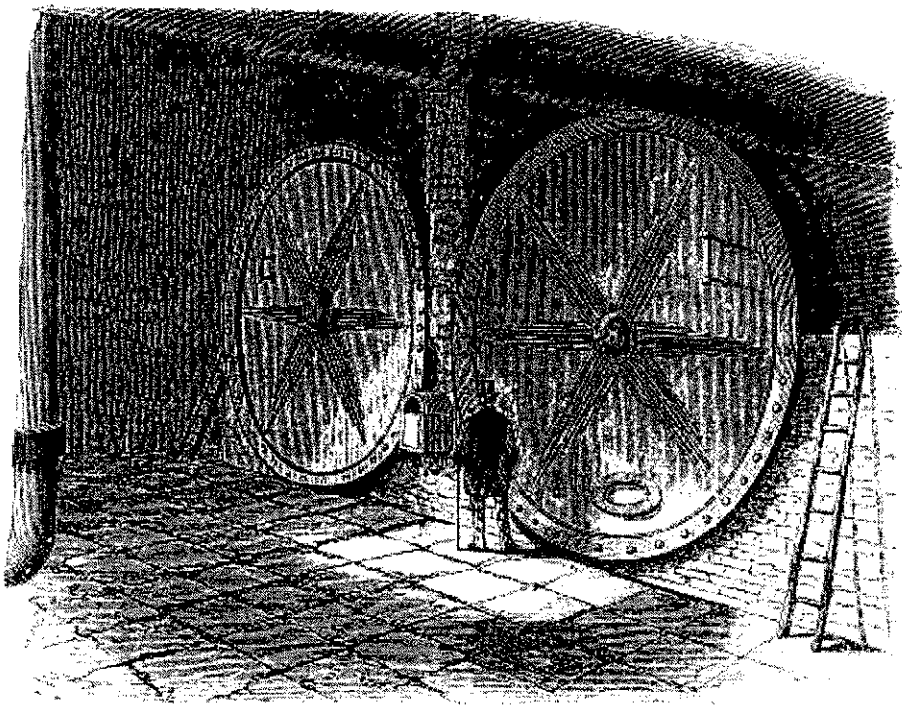
"The gas," said our guide, "is now ready for delivery to customers; but there is still a question as to how it shall reach them in such a way that one will be as well served as another. In a city lying as flat as New York this is not so much of a difficulty; but where there is great variation in the elevation of certain streets or districts a governor to the pressure becomes absolute, or those living in high spots would be crowded with gas, even to leakage, while those living on low ground would be almost lightless. To rectify this "the governor" was made to intervene between the gasholders and the mains. The governor is simply a gasholder on a small scale suspended like a bell, with a balance weight, and having an inlet and outlet pipe, the first having suspended over it a conical piston which regulates the admission of the gas in the inverse ratio of its pressure. To do this the piston is so constructed that it works on the principle of a bellows-valve, shutting the inlet pipe partially when the pressure is greatest. When once the gas is admitted to the cylinder or gasholder above the inlet pipe there is no farther trouble, it passes at a uniform rate into the mains.

"And now, gentlemen," says the engineer, "the gas is ready for customers, and, without taking any mischances into account, will be delivered at their doors, or even in the most private and tabooed apartment of their houses, in quantities to suit."

Then the engineer rubbed his hands, and looking straight at Septimus, said: "If we were like the sewers of Paris with our mains, gentlemen, I might take you through and show you that even after the produce of our retorts, condensers, and washers, is consigned to the bowels of the earth our care for it does not cease. As we can not, however, go physically, we will men-



THE REGISTER.



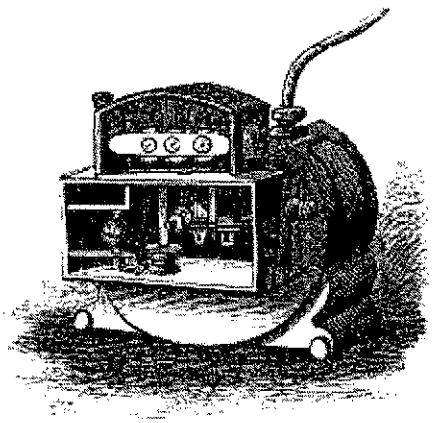
THE STATION METER.

tally." Here the engineer unrolled a mass of drawings to act as a guide in our dark passage, and proceeded:

"You will perceive, gentlemen, before we enter, that it is necessary to keep up within the works a certain amount of pressure that the gas may find its way to the customer. The regulation of this pressure is a very nice thing, and must be attended to with great care. Through the day a uniform rate is kept on of $\frac{8}{10}$ths of an inch; or, in plain words, such pressure as will raise water in a tube that distance. At night the pressure is increased according to the hour and the season—as, for instance, in winter, double the quantity of gas is burned than in summer: the pressure consequently is increased, and the same rule must be followed during different hours of the night. More gas is burning at 9 P.M. than at 12 P.M., and more at the latter hour than at 3 o'clock in the morning. That all this may be attended to properly a reliable man is kept at the pressure-gauge day and night, acting under instructions as to proper force. That the faithfulness of this watchman may be secured, a silent watchman is put over him in the shape of a 'register' in the office within, which marks through the still hours of the night the rate of pressure kept up. This pressure-indicator is a cylinder covered with paper and revolving by clock-work. Against it rests the point of a pencil, which pencil is acted upon by the pressure of the gas in the mains, and records in a rising or falling line as perfect a tell-tale of the doings of the watchman as would that famous speaking-bird of 'Arabian Nights' fame. The variation of pressure is from $\frac{7}{10}$ths of an inch to 3 inches.

"And now, gentlemen," continued our friend, waving his hand toward the drawings of pipes, as though he expected us to perform the feat of crawling bodily through them, "into the mains we go. The first pipe, as you see, is 30 inches in diameter, that being the largest size used, from that down to nothing. These pipes are of the invariable length of 12 feet. As we go on you will see that these mains are not laid exactly horizontal, but all run down hill a little, which is the inclination of the mains to the drips. You have no doubt observed frequently when passing through the streets a cast-iron plate, on which the letters 'Gas drip' stand out. To explain this it is necessary to show that after the gas goes into the mains it is subject to condensation in some degree. Carbureted hydrogens, our friend being of that family, condense into oil, and as it would not be good to remain in the pipes, provision is made to have it run off into these drips or receptacles by the gradual inclination of the pipes.

"You will also perceive as you go on spots here and there, where your passage is barred by a closed door, without crack or crevice. These are the 'valves.' We use two kinds of valves, the hydraulic and the slide or spring valve. The hydraulic valve is used only in the works, while the other is used through the streets. The object is to shut off the gas from any certain district when it becomes necessary, through any



THE WET METER.

accident or leakage—the last of which is a matter of so much importance to a gas company that every precaution must be taken to combat it. Our average loss from leakage, condensation, etc., is 12 per cent. of all the gas manufactured. The hydraulic valve works much on the same principle as the gasholder, being an inverted cup covering the top of a pipe, the edges of the cup immersed in water. The slide valve shuts like the sliding cover of a box, being accurately fitted to leave no aperture. Now, gentlemen, you have no farther interruption through the mains until you reach your own homes, if you can only manage to squeeze through the pipes."

I took this little sally of the engineer's for a gentle hint that he had been bored long enough with us and should have acted on it, but my young friend from Herkimer, gathering himself up suddenly with a-search-of-knowledge-under-difficulties air, says to the engineer,

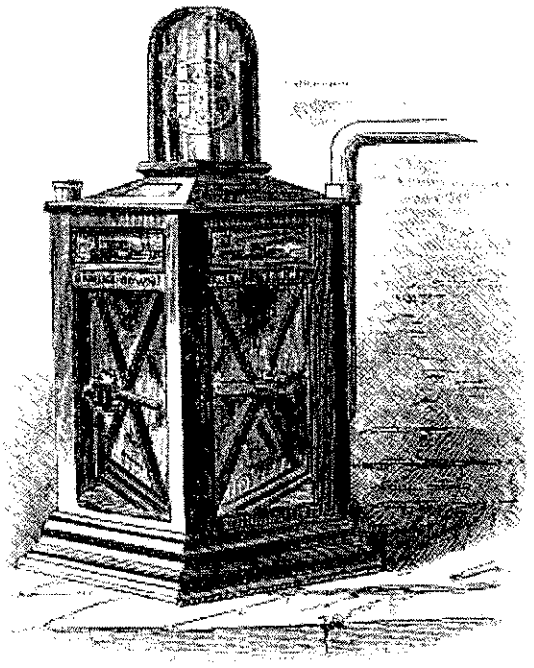
"How about the meters?"

"The meters, Sir? What about them? Do you want to know how they work? Come along, Sir, you shall see," and the engineer good-naturedly led us away to a meter.

"This little instrument, which is in reality one of the simplest things in the world, is made by gas consumers one of the most mysterious, on the principle that men must have something to grumble at, and perhaps it is better for them to grumble at a gas-meter than at any thing else. Of meters there are two kinds—the wet and the dry meter. The wet meter, which is the most used, though being slowly superseded by the dry meter, acts by a valve governed by a ball-float. When the water is kept up in the meter the valve is kept raised, the gas passes through into a chamber wherein a wheel or screw is turned by its passage, the turning of which acts upon the works of the meter clock, and registers exactly the amount of gas consumed or leaking out of the pipes beyond the meter.

"The dry meter differs from the wet entirely. They use no water, and are acted by valves instead of wheels. The best illustration that can be used is that of the bellows. Let us take the bellows-valve and attach clock-work to it, that an account may be had of the number of times it rises and falls, and we have the entire principle of the dry meter. Another illustration would be, that it is precisely on the principle of the cylinder of the steam-engine, the gas working on alternate valves, and moving a piston in the same way. Meters can be made of every size, even up to the power of measuring 60,000 feet or over per hour; that is the capacity of the station meter in these works: it is 15 feet in diameter, and will register one and a half million feet in twenty-four hours."

I could see by the expression of my young friend's face that he did not fully comprehend this elaborate explanation. He was not perfectly satisfied that the movements of the index across the face of the dial were a sure measure of the quantity of gas which has passed through the meter. For my own part I had no doubt in the matter. The theory of the operation of the meter is unquestionably correct. It ought to measure the gas accurately, and if properly constructed and kept in good working order, I think it must do so. At all events, until I have better grounds for doubting its accuracy than mere reports that Mr. A. and Mrs. B. found their monthly gas-bills the same, whether they burned



THE DRY METER.

ten or twenty lights, I shall hold fast to my belief in the accuracy of the meter. However, as I am of a statistical turn of mind, I intend to make a fair trial in my business establishment. I shall for the months of December and January keep an accurate account of the burners lighted and the number of hours in which each is used. If the meter fails to give an accurate account of the comparative quantity of gas consumed, my own interest as a stockholder in the Manhattan will not prevent me from making the result known through the columns of the daily press.

A MAN'S LIFE.

I THINK it is a soft warm morning in the early part of May instead of this stern month of December. As if by magic the snow that covers the ground vanishes. The grass is almost long enough for the garden scythe—the flower-beds are laden with buds—the tree-branches rattle no longer frostily in the wind, they rustle and wave and float on the balmy air. Those are not snow-birds that I see, but bright-winged creatures whose nests are among the rustling fields of corn, in fruit and forest trees. The earth has arrived at the joy of the transition—its discomforts, its uncertainties are over. Lovely are the peach and apple orchards in their bloom, and there is rejoicing in them not for the promise that shall be redeemed, but for the present glory.

Two young girls are walking in a long, shady lane that leads into the pasture-lands beyond the streets; to the level pasture-lands, not to any great height that commands a prospect of the country, nor to any depth from whence stars may be seen at noon. It is over a level country that they go, rich and fair in meadow-lands.

Often they have walked together through such paths; but on this evening it is for the last time in their life. Their long chats are being brought to a final conclusion, their confidences to an end; for to-morrow the elder of the girls is going away, and when she returns all things will be changed to both of them—within them and without them will be changed. For between the career of a fashionable lady and a seamstress there is an earth-wide dissimilarity and distance.

Under almost any circumstances she who will depart on the morrow would present a noticeable figure. Already she has lovers, though she is but a school-girl; already she has become accustomed to admiration, for she is pretty, and gay, adventurous, untrammeled in speech and mood—she does not stop at trifles. She sweeps through her books, and such duties as it pleases her to recognize, with a somewhat pretentious grace, even as through the quiet path where she and Helen Kyle are walking: with a pride that may not be quite justifiable she goes, and all forgive her for it—nay, rather estimate her according to her own valuation.

When she lingers over her school-books her long curls sweep the desk, and the light rests upon and lingers among them as if it admired them and loved to set off their beauty. She has large eyes, blue, bright, and proud—too proud indeed to serve their mistress well. She will never behold life as it is through them. Not at least as it is to the heroes and the martyrs. The long lashes are not called upon to veil them, the lids are drawn up straight. She looks out eagerly upon the world—she will see all that can be seen by her.

The boys at the academy are in a flutter on her account; gentlemen and ladies in society all know her by name and fortune. Sabrina Spring the name is, and as for the fortune it is enough to stagger a poor body only to think of. Many prophets prophesy proud things of her coming womanhood, which prophecies will verify themselves as surely as she lives. Of all her mates Sabrina is best known. Her beauty and position have conspired to her conspicuity. It can hardly follow, therefore, that she is thinking much of arithmetic and grammar.

Who is she that walks beside her? For her name, it is Helen Kyle; for her person, it is such as makes no show when contrasted with that of her companion. She is merely quiet, and modest, and pretty. The influence of Sabrina has not been lost upon her. It induces the younger girl to make the most of herself, and that is not a great deal—at least as it meets the eye. She is receptive, not original; good, not showy. She wears her hair as Sabrina wears hers, but the effect is not the same; the peacock and the oriole may bring themselves with equal care up to their best appearing, but there will still be a difference; and if the eye can not perceive it by reason of blindness, the ear will detect it, and fill the soul with light that it also shall discern and make the needful distinction. Helen's dress is plain to coarseness; but the way in which it is put on and worn testifies to the little maiden's niceness and purity of sense.

Helen is the daughter of Kyle the potter; Sabrina was born under another star, but they have been friends these five years. Now, however, as I said, the friendship is drawing to a close. They do not hint this to each other. They anticipate no such result. When Sabrina slips the circlet of gold from her hand upon Helen's neither of them think that the token is not so much a pledge of what shall be, as a memorial of what has been.

It is not exclusively, nor chiefly, perhaps in reality not at all, because of a noble disregard for the things prized as above all price at home, that Sabrina chooses to while away these last hours of her last day with Helen Kyle. Not because the parade and vanity and worldliness at home weary, shame, disgust her; she has, in sufficient measure, the spirit by no means rare among young people of every station, the proud rashness that mistakes "shows for things," and greatly plumes itself on the mistaking. In some way, not the best way—in some degree, not the most generous and certain—she despises her

APPENDIX D

TITLE SEARCH REPORT

Commonwealth
A LandAmerica Company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

I. Block 688 Lots 1001 and 1002:

A. Former Lot 21:

1. **Grantor:** Consolidated Gas Company of New York
   Grantee: Merchants Refrigerating Company of New York
   Deed dated 1/17/1916 and recorded on 1/17/1916 in Reel 202 Cp 494.

2. **Grantor:** Buffalo Refrigerating Company, Inc.
   f/k/a Pet Warhousing Company and Merchants Refrigerating Company of New York
   Grantee: Able Empire Group L.P.
   Deed dated 12/14/1982 and recorded on 12/29/1982 in Reel 657 Page 1970.

NOTE: Condominium created by Declaration recorded on 8/5/1983 in Reel 706 Page 996, consisting of 2 units, Unit 1 (Tax Lots 1001) and Unit 2 (Tax Lot 1002).

B. Block 688 Lot 1001:

1. **Grantor:** Able Empire Group
   Grantee: Able Empire Group
   Deed dated 2/6/1984 and recorded on 2/16/1984 in Reel 765 Page 355.

2. **Grantor:** Able Empire Group
   Grantee: Able Empire Group L.P.
   Deed dated 4/23/1996 and recorded on 5/23/1996 in Reel 2327 Page 218.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

C. Block 688 Lot 1002:

1. **Grantor:** Able Empire Group
   Grantee: Tenth Avenue Mini Storage Associates
   Deed dated 2/9/1984 and recorded on 2/16/1984 in Reel 765 Page 359

2. **Grantor:** Tenth Avenue Mini Storage Associates
   Grantee: Tenth Ave. Holdings LLC
   Deed dated 2/27/1998 and recorded on 10/1/1998 in Reel 2720 Page 2182.

3. **Grantor:** Tenth Avenue Mini Storage Associates, LLC (successor by merger to Tenth Ave. Holdings LLC)
   Grantee: Tenth Avenue Mini Storage Properties, LLC
   Deed dated 8/31/2001 and recorded on 9/24/2001 in Reel 3359 Page 2229.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

II. Block 689 Lot 17:

1. **Grantor:** Consolidated Gas Company of New York
   Grantee: New York State Realty and Terminal Company
   Deed dated 1/4/1917 and recorded on 1/4/1917 in Liber 3007 Cp. 63.

2. **Grantor:** The New York State Realty and Terminal Company
   Grantee: The New York Central Railroad Company
   Deed dated 12/28/1932 and recorded on 12/29/1932 in Liber 3854 Cp. 158.

3. **Grantor:** The New York Central Railroad Company
   Grantee: 10-42 Corporation
   Deed dated 1/5/1960 and recorded on 1/20/1960 in Liber 5103 Cp. 584.

4. **Grantor:** 10-42 Corporation
   Grantee: Irving Maidman
   Deed dated 6/29/64 and recorded on 8/13/1964 in Liber 5290 Cp. 193.

5. **Grantor:** Irving Maidman
   Grantee: Chatham Associates, Inc.
   Deed dated 3/12/1965 and recorded on 3/17/1965 in Liber 5318 Cp. 357.

6. **Grantor:** Chatham Associates, Inc.
   Grantee: Avon Associates, Inc.
   Deed dated 12/15/1971 recorded on 5/25/1972 in Reel 241 Page 1059.

7. **Grantor:** Avon Associates, Inc.
   Grantee: Sol Goldman d/b/a Empire Associates Realty Co.
   Deed dated 2/28/1978 and recorded on 3/21/1978 in Reel 431 Page 1898.

8. **Grantor:** Sol Goldman d/b/a Empire Associates Realty Co.
   Grantee: Edison Mini Storage Corporation
   Deed dated 5/23/1983 and recorded on 5/27/1983 in Reel 690 Page 1375.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

III. Block 690 Lot 12:

1. **Grantor:** Consolidated Gas Company of New York
   Grantee: The Armbro Stores and Garage Corporation
   Deed dated 8/1/1922 and recorded on 8/10/1922 in Liber 3294 Cp. 140.
   Affects Old Lot 14-19 and 48-53 Now Lot 12.

2. **Grantor:** Alfred H. Towney, referee
   Grantee: Whitlock Ave. 156th St. Realty Co. Inc.
   Deed dated 1/6/1925 and recorded on 1/8/1925 in Liber 3447 Cp. 460.
   Affects premises.

3. **Grantor:** Thomas C. Chimera, as referee
   Grantee: The Trustees of Columbia University in the City of New York
   Deed dated 9/9/1943 and recorded on 9/10/1943 in Liber 4229 Cp. 57.
   Affects premises.

4. **Grantor:** The Trustees of Columbia University in the City of New York
   Grantee: National Garage Co., Inc.
   Deed dated 1/14/1946 and recorded on 1/17/1946 in Liber 4404 Cp. 304.
   Affects premises.

5. **Grantor:** National Garage Co., Inc.
   Grantee: Cotard Realty Associates
   Deed dated 4/1/1981 and recorded on 4/3/1981 in Reel 561 Page 761.
   Affects premises and more. (Lots 12 and 29)

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica Company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

IV. Block 690 Lot 29:

1. **Grantor:** Consolidated Gas Company of New York
   Grantee: New York State Realty and Terminal Company
   Deed dated 1/4/1917 and recorded on 1/4/19172 in Liber 3007 Cp. 63.
   Affects premises.

2. **Grantor:** The New York Central Railroad Company
   Grantee: National Garage Co., Inc.
   Deed dated 9/23/1959 and recorded on 10/6/1959 in Liber 5093 Cp. 448.
   Affects premises.

3. **Grantor:** National Garage Co., Inc.
   Grantee: Cotard Realty Associates
   Deed dated 4/1/1981 and recorded on 4/3/1981 in Reel 561 Page 761.
   Affects premises and more. (Lots 12 and 29)

4. **Grantor:** Cotard Realty Associates
   Grantee: Somatic Realty LLC
   Deed dated 3/6/2002 and recorded on 3/7/2002 in Reel 3466 Page 135.
   Affects premises.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

V. **Block 690 Lot 20:**

A. **Old Lot 20**:

1. **Grantor:** Consolidated Gas Company of New York
   Grantee: Morania Realty Corporation
   Deed dated 3/28/1919 and recorded on 3/28/1919 in Liber 3064 Cp. 67.
2. **Grantor:** Morania Realty Corporation
   Grantee: United States Trucking Corporation
   Deed dated 6/6/1928 and recorded on 6/27/1928 in Liber 3667 Cp. 236.

B. **Old Lots 38 and 39:**

1. **Grantor:** The Fifth Avenue Bank of New York
   Grantee: John J. Casale
   Deed dated 8/7/1942 and recorded on 8/10/1942 in Liber 4168 Cp. 445.
2. **Grantor:** John J. Casale
   Grantee: United States Trucking Corporation
   Deed dated 2/19/1943 and recorded on 3/3/1943 in Liber 4193 Cp. 356.

C. **Current Lot 20 (f/k/a 38, 39 and 20):**

1. **Grantor:** United States Trucking Corporation
   Grantee: Cotard Realty Associates
   Deed dated 10/26/1978 and recorded on 11/1/1978 in Reel 458 Page 1499.
2. **Grantor:** John J. Casale
   Grantee: United States Trucking Corporation
   Deed dated 2/19/1943 and recorded on 3/3/1943 in Liber 4193 Cp. 356.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

VI. Block 690 Lot 40:

1. **Grantor:** Consolidated Edison Company Of New York, Inc.
   Grantee: The Huntoon Ice Company, Inc.
   Deed dated 2/14/1923 and recorded on 2/15/1923 in Liber 3321 Cp 483.
   Affects premises.

NOTE: Break in Chain of Title.

2. **Grantor:** Rubel Corporation
   Grantee: Rubel Realty Corporation
   Deed dated 4/8/1955 and recorded on 4/12/1955 in Liber 4918 Cp 402.
   Affects premises and more. (Lots 40 & 42)

\

3. **Grantor:** Rubel Realty Corporation
   Grantee: Rubel Corporation
   Deed dated 10/31/1955 and recorded on 11/7/1955 in Liber 4941 Cp 335.
   Affects premises and more. (Lots 40 & 42)

4. **Grantor:** Rubel Corporation
   Grantee: Ken-Mar Realty Corporation
   Deed dated 5/29/1956 and recorded on 6/4/1956 in Liber 4966 Cp 302.
   Affects premises and more. (Lots 40 & 42)

5. **Grantor:** Ken-Mar Realty Corporation
   Grantee: Mar-Ken Realty Corporation
   Deed dated 6/18/1959 and recorded on 6/18/1959 in Liber 5081 Cp 200.
   Affects premises and more. (Lots 40 & 42)

6. **Grantor:** Mar-Ken Realty Corporation
   Grantee: Jeff Rich Realty Corporation
   Deed dated 5/25/1961 and recorded on 5/26/2961 in Liber 5151 Cp 234.
   Affects premises.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

7. **Grantor:** Jeff Rich Realty Corporation
   Grantee: Eli Studios Inc.
   Deed dated 12/10/1969 and recorded on 12/12/1969 in Reel 159 Page 407.
   Affects premises.

NOTE: Break in Chain of Title.

8. **Grantor:** General Stage 19, Ltd.
   Grantee: Dia Art Foundation, Inc.
   Deed dated 10/19/1979 and recorded on 11/13/1979 in Reel 302 Page 891.
   Affects premises.

9. **Grantor:** Dia Art Foundation, Inc.
   Grantee: Haleakala, Inc.
   Deed dated 2/25/1987 and recorded on 3/18/1987 in Reel 1204 Page 2242.
   Affects premises.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

VII. Block 690 Lot 42:

1. **Grantor:** Consolidated Edison Company Of New York, Inc.
   Grantee: The Huntoon Ice Company, Inc.
   Deed dated 10/31/1922 and recorded on 11/13/1922 in Liber 3284 Page 456.
   Affects premises.

NOTE: Break in Chain of Title.

2. **Grantor:** Rubel Corporation
   Grantee: Rubel Realty Corporation
   Deed dated 4/8/1955 and recorded on 4/12/1955 in Liber 4918 Cp 402.
   Affects premises and more. (Lots 40 & 42)

3. **Grantor:** Rubel Realty Corporation
   Grantee: Rubel Corporation
   Deed dated 10/31/1955 and recorded on 11/7/1955 in Liber 4941 Cp 335.
   Affects premises and more. (Lots 40 & 42)

4. **Grantor:** Rubel Corporation
   Grantee: Ken-Mar Realty Corporation
   Deed dated 5/29/1956 and recorded on 6/4/1956 in Liber 4966 Cp 302.
   Affects premises and more. (Lots 40 & 42)

5. **Grantor:** Ken-Mar Realty Corporation
   Grantee: Mar-Ken Realty Corporation
   Deed dated 6/18/1959 and recorded on 6/18/1959 in Liber 5081 Cp 200.
   Affects premises and more. (Lots 40 & 42)

NOTE: Break in Chain of Title.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

6. **Grantor:** Maidmor Realty Corp.
Grantee: Irving Maidman
Deed dated 5/25/1961 and recorded on 7/5/1961 in Liber 5155 Cp 266.
Affects premises.

NOTE: Break in Chain of Title.

7. **Grantor:** Eagle Spring Water Co., Inc. Successor by merger of 520 West 19th St. Corp. and Eagle Spring Water Co., Inc.
Grantee: Foremost McKesson, Inc.
Deed dated 7/10/1970 and recorded on 7/13/1970 in Reel 178 Page 1077.
Affects premises.

8. **Grantor:** Foremost McKesson, Inc.
Grantee: Criette Realty, Inc.
Deed dated 10/6/1977 and recorded on 11/18/1977 in Reel 418 Page 360.
Affects premises.

9. **Grantor:** Criette Realty, Inc.
Grantee: J. Craig Johnson and Henriette Johnson,
joint tenants with right of survivorship
Deed dated 12/11/1986 and recorded on 12/24/1986 in Reel 1162 Page 2210.
Affects premises.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica Company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

VIII. Block 690 New Lot 46:

1. **Grantor:** The Mayor Alderman an Commonalty of the City of New York
   Grantee: Mary R. Handley, Adeline Fisher, Richard Hockman, Eliza Hockman, William Hockman and William H. Pope
   Deed dated 7/31/1868 and recorded on 1/29/1874 in Liber 1278 Cp. 178.

2. **Grantor:** Richard H. Handley, heir at law of Mary R. Handley deceased and as sole devisee under the L/W/T
   Grantee: Mary L. Osborne
   Deed dated 10/4/1887 and recorded on 10/4/1887 in Liber 2082 Cp. 251.

3. **Grantor:** Mary L. Handley, as sole legatee under the L/W/T of Richard H. Handley, deceased, Suffolk County, NY
   Grantee: Mary E. Woodard
   Deed dated 5/1/1923 and recorded on 8/16/1923 in Liber 3366 Cp. 341.

4. **Grantor:** Mary E. Woodard
   Grantee: Julius Ruff
   Deed dated 10/28/1936 and recorded on 12/16/1936 in Liber 3946 Cp. 393.

5. **Grantor:** Otilia Doll, Frederick Doll and Dorothy Sorr, as executors and trustees under the Will of Julius Ruff
   Grantee: National Garage Co., Inc.

   Deed dated 11/4/1963 and recorded on 12/10/1963 in Liber 5257 Cp. 77.

NOTE: Mary L. Osborne never conveyed her interest.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

6. **Grantor:** National Garage Co., Inc.
Grantee: United L.M.H. Corp.
Deed dated 10/31/1977 and recorded on 11/9/1977 in Reel 416 Page 1869.

7. **Grantor:** United L.M.H. Corp.
Grantee: John Lynch, Frank LaRuffa, William Lutter and Michael Lynch
Deed dated 8/8/1980 and recorded on 8/12/1980 in Reel 533 Page 1325.

8. **Grantor:** John Lynch, Frank LaRuffa, William Lutter and Michael Lynch
Grantee: William Lutter

Deed dated as of 7/2/1996 and recorded on 7/19/1996 in Reel 2346 Page 918.

9. **Grantor:** William E. Lutter
Grantee: 524 West 19th Street, LLC
Deed dated 9/26/1996 and recorded on 11/13/1996 in Reel 2391 Page 1562.

10. **Grantor:** 524 West 19th Street, LLC
Grantee: 524 West 19th Street Corp.
Deed dated 3/11/1998 and recorded on 7/13/1998 in Reel 2619 Page 1835.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

IX. Block 691 Lot 1:

1. **Grantor:** Consolidated Edison Company Of New York, Inc.
   Grantee: Young Men's Christian Association Of The City Of New York
   Deed dated 6/10/1929 and recorded on 6/11/1929 in Liber 3714 Cp 416.
   Affects premises and more.

2. **Grantor:** The People Of The State Of New York, acting by and through the Commissioner Of Correctional Services
   Grantee: New York State Urban Development Corporation
   Deed dated 12/1/1993 and recorded on 12/22/1993 in Reel 2039 Page 920.
   Affects premises and more.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

X. Block 691 Lot 11:

1. **Grantor:** Consolidated Edison Company Of New York, Inc.
   Grantee: Deposit Realty, Inc.
   Deed dated 2/2/1945 and recorded on 2/8/1945 in Liber 4336 Cp 622.
2. **Grantor:** Deposit Realty, Inc.
   Grantee: Chelsea Holdings, Inc.
   Deed dated 1/8/1947 and recorded on 1/9/1947 in Liber 4487 Cp 445.

3. **Grantor:** Chelsea Holdings, Inc.
   Grantee: Nathan Heller and Dora Heller, as tenants in common
   Deed dated 7/5/1961 and recorded on 7/6/1961 in Liber 5155 Cp 393.

4. **Grantor:** Nathan Heller and Dora Heller, as tenants in common
   Grantee: Nathan Heller, as to a 35% interest
   Dora Heller, as to a 35% interest
   Kenneth Heller, as to a 10% interest
   Natalie Effron, as to a 10% interest
   Estelle Guttman, as to a 10% interest as tenants in common, without rights of survivorship
   Deed dated 1/14/1965 and recorded on 1/29/1965 in Liber 5312 Cp 305.

5. **Grantor:** Dora Heller
   Grantee: Dora Heller, Kenneth Heller, Natalie Effron & Estelle Guttman Each Owning 25% interest, as tenants in common with no rights of survivorship.
   Deed dated 3/15/1984 and recorded on 5/18/1984 in Reel 794 Page 823.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica Company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

XI. Block 691 Lot 15:

1. **Grantor:** James Mackenzie and Jessie P. Mackenzie, his wife
   Grantee: Norant Garage Corporation
   Deed dated 5/2/1928 and recorded on 5/2/1928 in Liber 3657 Cp 264.

2. **Grantor:** Norant Garage Corporation
   Grantee: DHMS Realty Corp.
   Deed dated 3/17/1970 and recorded on 3/19/1970 in Reel 168 Page 752.

3. **Grantor:** DHMS Realty Corp.
   Grantee: HMI Enterprises, L.L.C.
   Deed dated 4/18/1995 and recorded on 4/25/1995 in Reel 2202 Page 226.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

XII. Block 691 Lot 19:

1. **Grantor:** Francis Laidraw Ogden, Gertrude Ogden, his wife and Mary Moore Ogden
   Grantee: Margaret Van Cortlandt Ogden
   Deed dated 5/2/1890 and recorded on 9/17/1895 in Sec. 3 Liber 3957 Cp 249.
   Affects premises.

2. **Grantor:** Margaret Van Cortlandt Ogden
   Grantee: Robert L. Graham Jr., and Ross F. Eadles, as Executors of and Trustees under The Last Will and Testament of Clement Moore Ogden, (deceased)
   Deed dated 12/23/1952 and recorded on 12/30/1952 in Liber 4814 Cp 203.
   Affects premises and more.

3. **Grantor:** Ross Eadles, and Robert L. Graham Jr.,as Executors of the Last Will and Testament of Clement Moore Ogden, (deceased)
   Grantee: Ross F. Eadles and Robert L. Graham, as Trustees Under the Last Will and Testament of Clement Moore Ogden, (deceased)
   Executors Deed dated 12/10/1957 and recorded on 12/12/1957 in Liber 5022 Cp 238.
   Affects premises and more.

4. **Grantor:** Ross Eadles, and Robert L. Graham, III, as Trustees Under the Last Will and Testament of Clement Moore Ogden, (deceased)
   Grantee: 525 West 19th Street Realty Co.
   Deed dated 6/30/1980 and recorded on 8/8/1980 in Reel 533 Page 825.
   Affects premises.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

5. **Grantor:** 525 West 19th Street Realty Co.
Grantee: 525 West 19 Street Associates
Deed dated 7/17/1984 and recorded on 7/24/1984 in Reel 816 Page 413.
Affects premises.

6. **Grantor:** 525 West 19 Street Associates
Grantee: 521 West 19th Street Corporation
Deed dated 11/25/1985 and recorded on 12/4/1985 in Reel 992 Page 1426.
Affects premises.

7. **Grantor:** 521 West 19th Street Corporation
Grantee: Vincent Hai, Robert Fu and Gary Pee, as tenants in common.
Deed dated 11/6/1987 and recorded on 12/18/1987 in Reel 1335 Page 226.
Affects premises.

8. **Grantor:** Alicia Kaplow, as Referee
Grantee: Lan Chen Corp.
Referee's Deed dated 6/19/1997 and recorded on 9/4/1997 in Reel 2493 Page 1780.
Affects premises.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

XIII. Block 691 Lot 43:

1. **Grantor:** William S. Moore, Barrington Moore and Alexander B. Moore, his wife
   Grantee: Benjamin Burges Moore
   Deed dated 4/1/1930 and recorded on 6/4/1930 in Liber 3772 Cp 140.

2. **Grantor:** Robert LeRoy and James P. Eadle, as Executors of and Trustees Under the Last Will and Testament of Benjamin Burges Moore, (deceased)
   Grantee: Max Denburg
   Executors Deed dated 11/9/1939 and recorded on 11/10/1939 in Liber 4032 Cp 466.

3. **Grantor:** Max Denburg
   Grantee: J.P.G. Realty Corporation
   Deed dated 11/29/1944 and recorded on 12/5/1944 in Liber 4322 Cp 473.

4. **Grantor:** J.P.G. Realty Corporation
   Grantee: President and Directors of The Manhattan Company, Samuel Galewitz and George Green
   Deed dated 10/16/1952 and recorded on 10/21/1952 in Liber 4804 Cp 540.

5. **Grantor:** The Chase Manhattan Bank (National Association) Samuel Galewitz, as Sole Trustee of the Last Will and Testament of Jacob P. Galewitz, (deceased)
   Grantee: Carolina Manufacturing Co., Inc.
   Deed dated 7/17/1978 and recorded on 7/21/1978 in Reel 446 Page 1273.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

XIV. Block 691 Lot 50:

1. **Grantor:** Wanna Holding Corporation
   Grantee: Nat Scheff
   Deed dated 1/2/1946 and recorded on 1/9/1946 in Liber 4400 Cp 514.

2. **Grantor:** Nat Scheff
   Grantee: Tanrah Realty Corp.
   Deed dated 5/3/1948 and recorded on 5/17/1948 in Liber 4570 Cp 64.

3. **Grantor:** Tanrah Realty Corp.
   Grantee: Alvin Glanzberg and Lola Lehrman
   Deed dated 8/6/1986 and recorded on 9/19/1986 in Reel 1119 Page 359.

4. **Grantor:** Lola Lehrman and Alvin Glanzberg
   Grantee: 532 West 20th Realty Corp.
   Deed dated 12/31/1993 and recorded on 1/31/1994 in Reel 2053 Page 1436.

No further deeds found through March 25, 2002.

Commonwealth
A LandAmerica company

Special Search No.: SS020418F

DEED CHAINS FOR WEST 18TH STREET WORKS

XV. Block 715 Lot 59:

1. **Grantor:** Consolidated Edison Company of New York, Inc.
   Grantee: 440 West Eighteenth Street Realty Corp.
   Deed dated 4/11/1944 and recorded on 4/12/1944 in Liber 4276 Cp 271.

2. **Grantor:** 440 West Eighteenth Street Realty Corp.
   Grantee: Retaco Holding Corp.
   Deed dated 3/12/1983 and recorded on 4/20/1983 in Reel 680 Page 609.

3. **Grantor:** Retaco Holding Company LLC
   Grantee: Retaco Holding Corp.
   Deed dated 1/29/1997 and recorded on 4/2/1997 in Reel 2440 Page 1904.

No further deeds found through March 25, 2002.

XV!. Block 662 (formerly block 666) unlotted:

Note: The index refers to a condemnation by the City of New York filed 6/10/1940. No record of this condemnation can be found.

No further deeds found through March 25, 2002.