HUDSON AVENUE GENERATING STATION
INVESTMENT GRADE COST STUDY

OPTION 3A
UPGRADE OF EXISTING ANNEX UNIT
AND ADDITIONAL PACKAGE BOILERS

FINAL REPORT

JULY 2007

PREPARED BY

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SUMMARY OF FINDINGS

Con Edison has contracted PB Power, in association with ENSR as environmental subcontractor, to perform an independent Investment Grade Cost Study for replacement options at the Hudson Avenue Generating Station. The main objective of the study is to develop the design scope and capital costs data to a level of detail that supports an investment grade decision by Con Edison. This report summarizes the results of our evaluation for Option 3A – Upgrade of the Existing Annex Unit and Additional Package Boilers. A separate report has been prepared for similar scope for Option 2 - the Installation of Four New Package Boilers.

Based on the project technical criteria, conceptual design arrangement, developed for this option and the general and specific assumptions presented in this report, PB Power is presenting the following key findings:

- The estimated total capital cost (EPC) for upgrading the existing Annex Unit (Unit 10/100) including SCR and CO catalyst systems retrofit, air cooled dump condenser, full turbine bypass is estimated to be ***[REDACTED]***. Table I below summarizes the capital cost estimates for upgrade of existing Annex Unit.

Table I – EPC CAPITAL COST FOR UPGRADE OF EXISTING ANNEX UNIT

ITEM #	COST COMPONENTS	LABOR TOTAL	MATERIAL TOTAL	TOTAL AMOUNT

Notes:
1 - The estimated total capital cost is escalated and presented in 2009 dollars.
2 - The estimated capital cost presented for Item 1 - Unit 100 Boiler SCR/CO System is based on EPC price including complete engineering design, equipment, materials and erection/installation, testing and commissioning.
3 - Engineering design estimate exclude allowance for SCR/CO System. Engineering cost for SCR/CO System is included in Item 1 estimates.
[REDACTED]
5 - Breakdown and detail of the capital cost estimate is presented in Section 3.0 – Project Capital Cost Estimate and Appendix II.

- The estimated capital cost (EPC) for two (2) new additional package boilers as part of Option 3A is estimated to be ***[REDACTED]***. Table II below summarizes the capital cost estimate for installation of two (2) Package Boilers.

Table II – EPC CAPITAL COST FOR 2 X 250,000 LB/HR PACKAGE BOILERS

ITEM #	COST COMPONENTS	LABOR TOTAL	MATERIAL TOTAL	TOTAL AMOUNT

Notes:
1 - The estimated total capital cost is escalated and presented in 2009 dollars.
2 - Item 4 (Water Treatment) cost estimate is included in Upgrade of Existing Annex Unit capital cost.
3 - Refer to Section 3 – Project Capital Cost Estimate for detail assumption descriptions of Contractor's Soft Costs.
4 - Breakdown and details of the capital cost estimate is presented in Section 3.0 – Project Capital Cost Estimate and Appendix II.

- Additional cost analysis has indicated that there appear to be a significant cost impact on the capital cost estimates using Non-EPC project delivery method. Based upon the assumptions considered for Non-EPC delivery approach, PB Power estimates the total capital cost for upgrade of existing Annex Unit to be approximately ***[REDACTED]***. The Non-EPC project delivery is approximately ***[REDACTED]*** **or 8%** lower than that of the EPC cost estimates. Refer to Section 3.5 for details of the Non-EPC cost estimates.

Option 3A has been evaluated by ENSR for potential environmental issues and potential permitting / approval implications. A preliminary air quality assessment considering all the regulations and emission / modeling analyses that will likely be required has been performed to the extent practicable without agency input. The permits / approvals that would likely be required for the Option 3A project have been identified, and the timeframe of up to 24 months has been estimated to obtain all these major environmental permits / approvals to commence construction. The obligations, procedures and issues under the NYS and NYC Environmental Quality Review process have been identified and discussed. Other environmental topics such as waste disposal, environmental justice, noise, modifications to the State Pollutant Discharge Elimination System and elements of a public outreach program have been addressed to determine any permitting implications. No fatal flaws have been

identified for Option 3A except for the possibility that $PM_{2.5}$ impacts resulting from Boiler 100 firing natural gas may exceed the significant impact level (SIL) at elevated receptors in Brooklyn. When the final rules regarding the assessment of $PM_{2.5}$ emissions (fine particulate) are issued by US Environmental Protection Agency (expected in September 2007) and adopted by NYS Department of Environmental Conservation (NYSDEC), the $PM_{2.5}$ emission netting and modeling impact assessment set forth in this analysis can be confirmed.

An Environmental Justice evaluation would likely be required if the Option 3A project is considered to have impacts on the surrounding community. No additional water withdrawal is needed from the East River; however, some increase in City-water usage is likely. Disposal costs of excavated soil associated with building a new boilerhouse could range from ***[REDACTED]*** depending on whether the soil is classified as hazardous or non-hazardous. Since the equipment / components comprising Option 3A would likely be delivered by barge, the nature of improvements / modifications to the waterfront area will determine the complexity of the Army Corps of Engineer's permitting process.

The results of this preliminary environmental assessment of Option 3A demonstrate that the replacement of the LP Boilers with an upgraded Boiler 100 and two package boilers is viable considering the discussion of issues presented in this section.

1.0 INTRODUCTION

Con Edison has contracted PB Power to perform an independent Investment Grade Cost Study for replacement options at Hudson Avenue Generation Station. This report summarizes the results of the Investment Grade Study of Option 3A – Upgrade of the Existing Annex Unit and Additional Package Boilers. The main objective of the PB Power assessment is to develop the design scope and capital costs to a level of detail that supports an investment grade decision by Con Edison. Two replacement alternatives previously investigated by Con Edison have been considered for the Investment Grade Cost Study. PB Power's Investment Grade study for Option 2 is described below and is addressed in a separate report.

This report provides an independent investment grade cost evaluation of upgrading the Annex Unit based primarily on technical criteria and review of available technical data provided by Con Edison including studies and analyses, historic performance and equipment data, outage reports, discussions with senior plant personnel and numerous visits to the facility. This report also provides an update of the Phase 1 study conducted by Con Edison evaluating the replacement options for the existing Hudson Avenue Generating Station facility.

The Investment Grade Cost Study has been divided into the following clearly defined options:

- Option 2 - Package Boilers: Installation of several shop assembled package boilers for total net steam send out of 1,600,000 lb/hr.

- Option 3A – Upgrade of Existing Annex Unit and Additional Package Boilers: Upgrade of existing Unit 10/100 (Annex) and installation of additional packaged boilers for total net steam send out of 1,600,000 lb/hr.

1.1 Project Background

Con Edison is proposing to upgrade the existing Annex Unit under Option 3A of the Investment Grade Study for Replacement Options at Hudson Avenue Generating Station. The resurrection of Unit 10/100 will include the addition of two (2) new package boilers to supplement the Unit 10/100 output and to meet the peak steam send out demand of 1,600,000 lb/hr, a full flow steam turbine bypass, and an air cooled dump condenser.

Unit 10/100, capable of producing 65 MW electric power and approximately 1,100,000 lb/hr of steam, was originally commissioned in the early 1950s and retired from service in 1997. It was placed back in service in July 2001 and was permitted under the Stations Title V Air Permit for a limited 39-month period. The unit was again retired from service on October 1, 2004 in accordance with conditions of the station's Title V permit and the shutdown plan approved by the New York State Department of Environmental Conservation (DEC). Unit 10/100 operates on No. 6 oil.

The proposed upgrading of Annex Unit will require conversion of the existing Unit 100 high pressure boiler to natural gas and No. fuel 2 oil firing (No. 2 fuel oil as backup fuel). The existing boiler will also have to be retrofitted with Selective Catalytic Reduction (SCR) system and Carbon Monoxide (CO) catalyst system to meet current environmental regulations. The existing 66 MW steam turbine will be refurbished and upgraded with the addition of a full flow turbine bypass and an air cooled dump condenser to allow the facility to generate maximum electric power even in very low steam send out. The upgrade of Annex Unit is expected to generate a net steam of approximately 1,100,000 lb/hr to the Con Edison Steam System.

1.2 Purpose and Objectives

The main purpose of the Investment Grade Cost Study is to provide a comprehensive design scope, capital cost estimates and O&M cost assessment to a level of detail that support an investment grade decision by Con Edison based on the scope and direction consistent with the project technical criteria. In addition, the study includes complete assessment of the environmental and permit requirements for the proposed project.

The PB Power study considers two (2) options previously selected by Con Edison. In this study, PB Power has evaluated the refurbishment and upgrading of Annex Unit (Unit 10/100) to provide base load power supply and steam. The refurbishment is expected to extend the Unit 10/100 operational life for another 20 years period. The other replacement options are based on installation of new package boilers or gas turbine based cogeneration plant with expected similar net steam send out capacities.

1.3 Con Edison Technical Criteria

The development of the study for resurrecting Unit 10/100 and installation of package boilers under Option 3A is guided by the following technical criteria and requirements set by Con Edison.

- Upgrade of existing Annex Unit and installation of two (2) new additional package boilers.
- Retain existing high pressure steam turbine and install full flow turbine bypass with pressure reduction and desuperheating station.
- Install full capacity air cooled dump condenser to be located north of the existing Annex building inside John Street.
- Primary fuel is natural gas with No. 2 fuel oil as backup fuel.
- Include emission reduction technologies (SCR and CO catalyst systems) on both boiler 100 and package boilers.
- Package boilers shall be modular and include high efficiency components such as economizers or air heaters.
- DCS plant controls to be Ovation by Emerson Process Solution or equivalent.
- Major auxiliary equipment shall include N+1 design redundancy (i.e. 3 x 50% capacity boiler feed pumps)

1.4 Study Methodology and Approach

In performing the Investment Grade Study, PB has used the following methods and approach:

- Review and identify Con Edison's objectives and technical criteria for the upgrade Annex Unit.
- Review of the Phase 1 study prepared by Worley Parsons which provided assessment of the replacement options, alternative options, technical description and cost estimates.
- Evaluate the physical condition of Annex Unit equipment based on the review of available maintenance/outage reports and records, inspection reports, studies, repairs, replacement and present status of equipment and through discussion with Con Edison senior plant personnel and engineering personnel in the main office.
- Identify and develop design scope and conceptual design for Annex Unit upgrade and additional package boilers.
- Identify the size and location of new additional package boilers.
- Identify all demolition requirements for Annex Unit upgrade option.
- Develop conceptual plant layout, general arrangement drawings, process and instrumentation diagrams, material takeoff and other engineering design documents.

- Prepare project descriptions including narrative description of major systems, interfaces with existing stations systems such as steam, gas, water, etc.
- Solicit budgetary quotes from various vendors of major equipment.
- Develop capital cost estimate for Unit 10/100 upgrade option.
- Provide full air permitting evaluation. Identify permit requirements for the proposed project. This includes all local, state and federal air and water permits as well as noise, zoning and applicable government regulatory approval.
- Develop O&M cost
- Develop preliminary schedule
- Develop and submit investment grade cost study report for Option 3A

1.5 General Assumptions

PB Power has made various general and specific assumptions to develop the Investment Grade Cost Study for Option 3A. The cost estimate and conceptual design materials for this study were produced using these general assumptions together with the Phase 1 study preliminary assessment findings and recommendations by Con Edison. While the design materials presented in this study may be used as starting points for the plant engineering design, it must be recognized that these documents will require a more detail investigation and modification to deal with site specific conditions.

The list below contains both the provided assumptions as well as those that became necessary to make during the course of the work. Specific technical and cost assumptions covering each major scope of work are presented in Section 3.0 – Project Capital Cost Estimates.

- The estimates are based on normal market conditions in effect in 2007 regarding procurement of equipment and construction and O&M. The equipment and bulk material cost costs is based on 2007 pricing and have been escalated ***[REDACTED]*** annually and presented to reflect year 2009 dollar values.

- Rates have been adjusted to reflect union wage rates for the New York City area. The construction is based on 40-hour workweeks and a normal amount of lost time due to weather problems. The adjusted rates include all contractor indirect costs. The wage rates have been escalated ***[REDACTED]*** annually and presented to reflect year 2009 dollar values.

- The project will be performed as an Engineering Procurement and Construction (EPC) project with a single EPC contractor who will have full responsibility for engineering, design, procurement of equipment, purchasing of bulks and construction materials, construction, start up, testing, and meeting of schedule and performance requirements.

- The construction site boundary is identified as the existing Annex Unit footprint area and the adjacent available area across John Street, south of the existing Switch house.

- Remediation and demolition works is assumed to be performed by a separate contractor from the EPC contractor. A separate cost is estimated and included for demolition work of affected structures, system and equipment identified including the removal and remediation of hazardous materials.

- Estimates for underground obstructions, poor soil conditions, rock excavation, etc. have not been provided for. Removal and relocation of any existing underground utilities, power transmission and re-routing of any existing utilities not specifically mentioned to be part of the cost estimates are not included.

- Contingencies are included in the cost estimate to provide an allowance for unknowns. Contingency for the cost estimate will be expressed as a general contingency. If a major item

of concern should arise that could be of significant cost, but is unknown as to its status on the project, a specific contingency could be included to allow funds for that specific purpose.

- The design of the emission control system for the Unit 100 boiler and two (2) package boilers is based on the environmental requirements and regulations in place in 2007 and does not represent a departure from standard industry environmental concerns including NYC code.

- Startup services costs are included in the estimates. The start-up services include relay setting and testing, vibration testing services, steam blow equipment and setup/removal, chemical cleaning services, lube oil flush services, safety valve setting, vacuum leakage snoop, inspection services, vendor representative services and miscellaneous startup services.

- Engineering cost has been calculated as the cost to perform all preliminary and detailed engineering and design for all scope of work considered. It includes specifying and procuring every item of equipment, performing project scheduling and cost control services for the entire project; providing engineering and design liaison during the construction period; and providing startup support during the transition from construction to commercial operation.

- Construction management services cost includes a field management staff capable of performing all field contract administration; field inspection and quality assurance; project construction control; safety and medical services as required; field and construction insurance administration, field office clerical and administrative support. Professional services cost for construction management and start-up is higher for NYC than any other area due to the union wages and union manning rules and productivity

- All equipment costs are assumed to include the cost of freight from the manufacturers' works to f.o.b. job site. Allowance is established for heavy haul for the moving of major components to along side major equipment foundations. Allowance for barge delivery, loading/unloading, and receiving of major equipment and bulk materials on the existing Hudson Avenue unloading dock is included. Equipment logistics are to be planned so that double handling of major equipment components will not be required.

- The estimate considers predominantly US manufactured and supplied equipment and services. Some equipment items are considered as worldwide sourced because US manufacturers may no longer exist. Virtually all equipment items have at least some US content or final assembly.

- ***[REDACTED]***

2.0 EXISTING HUDSON AVENUE GENERATING STATION

2.1 Project Site Description

The Con Edison Hudson Avenue Generating Station is originally a steam and power generating facility located on the southeast shore of East River at 1-11 Hudson Avenue, Brooklyn New York. The generating facility occupies an area of approximately 13 acres and encompasses six city blocks. The site is bounded by the East River on the north and by John Street and Plymouth Street on the south. The New York City Red Hook Water Pollution Control Plant and Brooklyn Navy Yard are located on the east side of the generating station facility and the west side is bounded by Gold Street. The Hudson Avenue Station is comprised of four (4) LP boilers, one (1) retired HP Boiler and Steam Turbine (Annex) and three (3) gas turbines.

The Low Pressure Boiler House which contains the four (4) low pressure (LP), natural circulation, balanced draft, non-reheat boilers (Nos. 71, 72 and 81, 82) with combined net steam output of 1,600,000 lb/hr is located adjacent to the dock and the East River, bounded by Marshall Street on the south and Hudson Avenue on the west. The LP boilers currently operate on No. 6 fuel oil and No. 2 oil/kerosene for ignition.

The retired High Pressure Unit 10/100 is housed in the Annex Building (Annex) consisting of Unit 100 high pressure, natural circulation, balanced draft boiler and Unit 10 high pressure, non condensing 65 MW steam turbine. The Annex building is located at the corner of Hudson Avenue and Plymouth Street.

The gas turbine area is located north of Marshall Street and the fuel oil Tank Farm. The gas turbine area consist of three (3) GE Frame 5001 LA gas turbine generators each rated at 15MW. The gas turbines currently operate on kerosene. The gas turbines have two 258 gallon dump tanks located on the north side of the units.

Figure 2-1 below shows the bird's eye view of the Hudson Avenue Generating Station facility.

Figure 2-1

Unit 10/100 was originally commissioned in the early 1950s and retired from service in 1997. The unit consists of a boiler and a topping turbine, which had the capability to simultaneously deliver steam and electricity. Unit 10/100 was placed back in service in July 2001 and was permitted under the Stations Title V Air Permit for a limited 39-month period. Unit 10/100 was again retired from service on October 1, 2004 in accordance with conditions of the station's Title V permit and the shutdown plan approved by the New York State Department of Environmental Conservation (DEC).

The key aspects of Unit 10/100 are summarized below:

REDACTED

The LP boilers currently burn No. 6 fuel oil stored in the station's fuel oil tanks (Tank Farm). The Tank Farm consists of four (4) rectangular steel underground vaulted tanks (F06-1, F06-2, F06-3 and F06-4) arranged side by side, each with storage capacity of approximately 2.75 million gallons. Each tank is located within a reinforced concrete dike.

REDACTED

2.2 Project Layout

The layout of the major equipment and structures is shown drawings ME3A-01 and ME3A-02. Drawings ME3A-03 and ME3A-04 illustrate the proposed general arrangement of the SCR and CO system retrofit into existing Unit 10/100. The drawings illustrate the overall arrangement of the plant buildings and indicate the setting and orientation of major equipment. These design materials were the basis of PB Power's cost estimates.

A detailed plant arrangement shall be developed by the Contractor during detailed design to show the overall building configuration, including internal and external walls and column rows, floor outlines, stairways, access ways and hatches, stack foundations and other details. The plant arrangement design shall satisfy equipment installation, access and maintenance requirements.

Except for the minor selective demolition of the existing Annex Building to accommodate the new SCR and CO housing, it is anticipated that the Unit10/100 arrangement will be maintained. ***[REDACTED]***

Safety reasons and the close proximity of the existing Annex Unit to residential area resulted in the selection of 50% urea to ammonia conversion system for the SCR. The urea storage tank, urea to ammonia conversion system and metering module for Unit 10/100 and package boilers SCR system will be installed on the empty space at the northwest corner of the Annex property line south John Street for better access for urea delivery.

A new package boiler building will be constructed to house two (2) package boilers and their corresponding accessories. ***[REDACTED]***

The new package boiler plant building will be structural steel frame type. The occupational classification of the new building will be as per RS-3 standard of the New York City Building Code. Based upon the hazard classification of the building, the building columns, girders, roof trusses, vertical bracings, etc. will require fireproofing of varying ratings. The ground floor of the building will be concrete, all other floors and platforms will be gratings. The new package boiler building will be approximately 230 feet long, 50 wide and 70 feet high. The pump room will be located on the east side of the main boiler building which will house the deaerator, pumps and chemical injection system. The air cooled dump condenser for Unit 10/100 will be located on the roof of the package boiler building as shown on the drawing.

REDACTED

Major equipment is expected to be delivered by barge due to the narrow streets surrounding the plant. The unloading of large and heavy lift equipment and materials is anticipated to be through unloading dock located approximately 1,000 feet north of the Annex building at the East River. Vehicular access to the area is from Hudson Avenue to the west and John Street to the north.

Several locations can be utilized as lay down area for equipment and materials including the empty space at the north side of the Maintenance and Storage Building. The area can be cleared and made suitable as lay down area for equipment and materials. It is anticipated that the empty space allocated for the package boiler building could be utilized as temporary lay down area during the installation Annex Unit boiler SCR and CO system.

PLOT PLAN

DRAWING NO. ME3A-01

REDACTED

PLAN WITH ROOFTOP STEAM DUMP CONDENSER

DRAWING NO. ME3A-02

REDACTED

3.0 PROJECT CAPITAL COST ESTIMATE

3.1 Basis of Estimate

The following capital cost estimates provide the project cost for lump sum Turnkey Engineering, Procurement and Construction (EPC) costs for the Option 3A – Upgrade of Existing Annex Unit and Additional Package Boilers. The estimates are in accordance with the identified scope of work, technical criteria, descriptions of the facility, emissions study and general conceptual design arrangement for the Unit 10/100 and two (2) package boilers.

The cost estimates including material and equipment prices, bulk materials and labor rates have been escalated and provided based on year target “Notice to Proceed” date of January 2009.

The scope of work under Option 3A includes all works defined for refurbishment and upgrade of Unit 100 High Pressure Boiler including retrofit of emission control equipment (SCR/CO system) and burners conversion to natural gas and No. fuel oil, refurbishment and upgrade of Unit 10 High Pressure Steam Turbine, installation full flow turbine by-pass system, installation of air cooled dump condenser, installation of two (2) x 250,000 lb/hr package boilers and auxiliaries.

The capital cost estimates assumed all known work is contained within the plant site identified as Annex Building area and the identified location of the new package boilers. Estimated Contractor Soft Costs are included. Con Edison’s overhead costs are not included.

As noted in the Section 1.5 -General Assumptions, PB Power labor rates have been adjusted to reflect union wage rates for the New York City area. The adjusted rates include all Contractor indirect costs including equipment rental, tools, site supervision, home office support, on-site facilities such as office trailers, sanitary facilities, warehouses, lay down area, site security, site utilities, communication; etc). The construction is based on 40-hour workweeks and a normal amount of lost time due to weather problems.

The approach applied in the conceptual design and cost estimate is commensurate with the technical criteria and direction set by Con Edison. The cost of major equipment was derived mainly from budgetary vendor quotations and data available in-house at PB Power. The costs for other specific major scope of work such as the demolition and soil remediation, etc. were derived from specialized contractor’s quotations. The cost for specific major scope of work such as the retrofit of SCR and CO System for Unit 10/100 including all required refurbishment were derived from a turnkey EPC quote from vendor familiar with NYC construction.

In general, the equipment and conceptual arrangement have similarly been taken from PB Power's previous work and modified as necessary to meet the requirements of the scope of work considered herein. The package boilers and the retrofit of SCR/CO system into Unit 100 arrangements presented in this Investment Grade Study are considered functional but are not fully optimized. We have been careful to apply the same principles in the conceptual design and cost estimates for all the other scope of work to upgrade Unit 10/100 under the Option 3A.

Contingencies and fees included in this investment grade study estimate are based only on the scope estimated. That is, the contingency percentages have been applied to all equipment and scope of identified under Option 3A.

3.2 Specific Assumptions for Upgrade of Existing Annex Unit

The cost estimate and conceptual design materials for the upgrade of Unit 10/100 were produced using the general assumptions stated earlier in this report together with the following assumptions that are specific to this scope. PB Power has made the following assumptions based on the information and technical criteria provided by Con Edison, as well as other good engineering practices and practicalities for an economical commercial project.

The assumptions are categorized as Commercial, Mechanical, Electrical, Civil and Structural, Instrumentation and Controls. Changing of these assumptions may affect the estimated cost of a project.

Commercial

- The construction is assumed to be based on 40-hour workweeks and a normal amount of lost time due to weather problems.
- Equipment and bulk material prices were escalated 15% annually to reflect year 2009 prices.
- Labor costs were escalated 5% annually to reflect year 2009 costs.
- Contingency and fee included in this study's estimate are based only on the scope estimated.
- Contractor's 10% contingency for labor, equipment, materials and services is included.
- Equipment and material cost includes freight from manufacturer's works to job site (f.o.b. job site).
- Owner's overhead costs including taxes, permits, licenses fees, utility connection upgrade, legal and financial costs, interest during constructions, spare parts and administration cost are not included.
- On-site transportation, unloading, receiving, rigging and alignment costs are included.
- Contractor's ***[REDACTED]*** fee of total direct and indirect costs is included.
- Contractor's ***[REDACTED]*** profit for labor and equipment is included.
- Contractor's ***[REDACTED]*** of total direct and indirect costs for permits, licenses, fees and miscellaneous is included.
- Contractor's ***[REDACTED]*** of total direct and indirect costs for warranty, insurance and bonds, legal cost is included.
- Cost for spare parts is not included.

Mechanical

REDACTED

Electrical

REDACTED

Instrumentation and Controls

- *[Redacted]*

REDACTED

Civil/Structural

REDACTED

3.3 Specific Assumptions for Package Boilers

The following specific assumptions have been developed to separate the costs associated with the package boilers. Similar to Unit 10/100 upgrade, the assumptions are categorized as Mechanical, Electrical, Civil and Structural, Instrumentation and Controls and Commercial.

Mechanical

REDACTED

Electrical

REDACTED

Civil/Structural

REDACTED

3.4 Cost Estimates

The project cost estimates was prepared using the general and specific assumptions stated earlier. The cost estimates developed by PB Power are based on budgetary quotations from different equipment vendors and in house cost database from other comparably sized projects. The labor costs have been adjusted to reflect New York City labor rates. The cost estimates have been escalated and presented in 2009 dollars.

The capital cost estimates has been broken into two major components as per direction from Con Edison. All costs associated with package boilers are provided separately from the costs associated with the upgrade of Unit 10/100.

In addition, PB Power has evaluated the cost impact of Non-EPC project approach to determine any potential cost impact for Option 3A. The result of our additional assessment is presented in Section 3.5.

Tables 3-1 and 3-2 below summarize the capital cost estimates for upgrading Annex Unit (Unit 10/100) and two (2) package boilers respectively.

Refer to Appendix II for full details of the cost estimates.

Costs listed in the table are for material and direct labor for installation of each item.

Table 3-1 EPC Cost Estimate for Upgrade of Annex Unit (Unit 10/100)

COST COMPONENTS	Total Labor	Total Material	Total Cost	Escalated Total Cost	Percent of Grand Total

REDACTED

COST COMPONENTS	Total Labor	Total Material	Total Cost	Escalated Total Cost	Percent of Grand Total

Notes:
1- Estimated SCR/CO system cost estimate is based of full turnkey EPC including engineering design.
2- Engineering cost estimate excludes SCR/CO system.
3- Items 10 (Contractor's Soft Costs) and 11 (Contingency) presented exclude allowance for SCR/CO System.
4- Estimated total capital cost is escalated and presented in 2009 dollars.

Table 3-2 EPC Cost Estimate for 2 x 250,000 lb/hr Package Boilers

COST COMPONENTS	Total Labor	Total Material	Total Cost	Escalated Total Cost	Percent of Grand Total

REDACTED

COST COMPONENTS	Total Labor	Total Material	Total Cost	Escalated Total Cost	Percent of Grand Total

REDACTED

Notes:
1 - Item 3 (Water Treatment) cost estimate is included in capital cost for Upgrade of Existing Annex Unit
2 - Estimated total project cost is escalated and presented in 2009 dollars. See Section 1.5 for the materials and labor escalation descriptions.

3.5 Non-EPC Cost Estimates

At the request of Con Edison, PB Power has evaluated the potential cost impact on the estimated total capital costs presented in Table 3-1 for Annex Upgrade by Non-EPC project implementation approach. In order to determine the cost impact of the Non EPC approach on the estimated capital costs for the upgrade of existing Annex Unit, PB Power has made the following assumptions:

Table 3-1 presented above includes specific cost items directly associated to an EPC project approach. The specifics cost items are grouped and presented under the "Contractor's Soft Costs" reflecting the specific commercial assumptions considered. The assumptions include the following:

- Contractor's ***[REDACTED]*** fee of total direct and indirect costs
- Contractor's ***[REDACTED]*** profit total direct and indirect costs
- Contractor's ***[REDACTED]*** of total direct and indirect costs for permits, licenses, fees and miscellaneous
- Contractor's ***[REDACTED]*** of total direct and indirect costs for warranty, insurance and bonds and legal cost

In order to determine the cost impact of the Non-EPC approach on the estimated capital costs presented on Table 3-1 for Annex Unit, PB Power has modified the above commercial assumptions to exclude the cost items typically associated with an EPC project delivery. The modified assumptions for Non-EPC are presented below.

- Con Edison will directly purchase the major equipment and bulk materials for Annex Unit upgrade and will furnish the equipment to the selected contractor or various contractors.
- Contractor's ***[REDACTED]*** profit allowance is applied to labor cost component only. It is assumed that there will be a ***[REDACTED]*** savings on direct purchase of equipment and bulk materials by Con Edison.
- Contractor's ***[REDACTED]*** of total direct and indirect costs for permits, licenses, fees and miscellaneous has been excluded. It is assumed that Con Edison will arrange all necessary permits, licenses and miscellaneous fees associated with project implementation.
- Contractor's ***[REDACTED]*** of total direct and indirect costs for warranty, insurance and bonds, legal cost, etc. is applied to labor components only. It is assumed that the selected contractor/s will provide the necessary warranty, insurance and bonds for the installation cost components only.
- In the absence of specific costs associated with "Contractor's Soft Costs" for the SCR/CO system quoted by Peerless and to be consistent with the assumptions for all the scope of work under this option, PB Power has applied a similar set of Non-EPC assumptions described above to the SCR/CO system.

Based upon the assumptions considered for Non-EPC project approach, it is estimated that there is a significant cost difference between the two delivery methods. PB Power estimates the total capital cost for Option 3A - Upgrade of Existing Annex Unit (excluding the package boilers) with Non-EPC delivery method is approximately ***[REDACTED]*** million (2009 dollars). The Non-EPC project delivery is approximately ***[REDACTED]*** (2009 dollars) or ***[REDACTED]*** lower than that of the original EPC cost estimate presented in Table 3-1.

Table 3-3 below summarizes the capital cost estimates comparison for EPC and Non-EPC delivery methods for Annex Unit upgrade.

Table 3-3 EPC and Non-EPC Cost Comparison for Upgrade of Existing Annex Unit

Item #	Cost Components	EPC Amount	NON-EPC Amount

4.0 ANNEX UNIT (UNIT 10/100) CONDITION REVIEW

PB Power has performed a limited condition review of the Unit 10/100 as part of the Option 3A Investment Grade Cost Study. The Unit 10/100 condition review is limited to the review of the most recent available inspections and outages reports, previous studies and analyses, interview of key senior plant and engineering personnel. PB Power has made several visual inspections to get first hand information on the current condition of the facility. PB Power has also sought the assistance of major boiler manufacturers and boiler service contractors to determine the current condition of the Unit 100 based on available records and visual inspections. Initially B&W agreed to provide additional insight into the cost and needed repair of the boiler, however as the project progressed, they did not provide any additional assistance. It is expected that if the decision to move forward on the upgrade of Unit 10/100, B&W will be more responsive.

According to Con Edison senior plant personnel and the available records, the Unit 10/100 was in operational condition prior to being taken out of service in October 2004. The records also show that a major overhaul was conducted in 1994 to refurbish the facility prior to retirement in 1997. In addition, all asbestos containing material insulation of the Unit 10/100 facility has been removed and reinsulated with asbestos free materials.

During the visual inspections, readings of control board meters, records and gauges could not be noted in order to determine the operating status of the plant equipment and compared with design data for the plant as the facility was not operating. Considering the age of the facility and number of years since taken out of service, the existing unit 10/100 is generally well maintained and in good condition. This is an indicator of the presence of pride in workmanship in plant housekeeping. At the time of the visits, the plant was clean and neat. Significantly, the equipment components were clean and well maintained. The attitudes presented by operating personnel during various visits were positive.

4.1 Unit 100 Boiler

Review of the latest available inspection report conducted by B&W during the spring outage of October 2004 has indicated that the Unit 100 boiler is generally in good to fair condition with instances of air leakage, damaged and missing refractory and boiler tube misalignment.

Senior plant personnel have indicated to PB Power that the Unit 100 was in operational condition prior to retirement in 2004. PB Power limited condition review concurs with B&W inspection report that the Unit 100 is generally in good condition. However, PB Power would recommend that a major inspection and tests shall be conducted before putting the unit in service. The Table 4-1 below summarizes the B&W boiler inspection report of 2004:

Table 4-1 2004 B&W Boiler Inspection Report Summary

Boiler Components	B&W Inspection	Comments

REDACTED

REDACTED

4.2 Unit 10 Steam Turbine Generator

The Unit 10 steam turbine was placed is service as a topping unit in 1951. According to available information, the unit was shutdown from 1977 to 1980. As of this writing no information is available to confirm the year of the shutdown or to verify the cause for the shut down. The steam turbine was put back in service from 1980 to 1997. During this period the steam turbine was generally run year round except for spring and fall maintenance outages. The steam turbine was retired again from 1997 to 2001. In 2001 to 2004 the unit was put back in service to meet the short term New York City electric demands. Information made available to PB Power has shown the following original design modification of the steam turbine:

REDACTED

The last major overhaul was completed in 2001 in which the following activities were performed to extend the life of the steam turbine generator:

- Replacement of damaged rotating and stationary stage seals
- Repair of severely damaged steam inlet nozzle block
- Removal / inspection / repair of the turbine rotor
- Removal and inspection of the generator rotor.

Interview with key plant personnel and visual inspections of the equipment have indicated that the steam turbine is in generally good condition. The steam turbine unit is currently off the turning gear and properly protected. PB Power has reviewed numerous outage/inspection reports and studies starting from 1991 to 2003. These documents have shown that the steam turbine life extension overhauls were performed in 1986, 1993, and 2001. Damaged or worn components were either repaired or replaced to bring the unit to its design basis during these life extension overhauls. Table 4-2 below summarizes the latest inspection results (2003) of the steam turbine unit.

Table 4-2 Steam Turbine Inspection Report Summary

Steam Turbine Components	Comments

REDACTED

REDACTED

4.3 Unit 10/100 Feed Water System

PB Power has conducted a limited condition review of the existing feed water system based on available inspection and assessment reports, visual inspections of major components and interviews of key plant personnel.

Given that the facility has been out of service since 2004 and most of the major equipment and piping are insulated, visual inspections were insufficient to gauge the actual physical condition of the feedwater equipment and components. PB Power condition review of the feed water system has relied heavily on the accuracy of the available inspection and assessment report.

The inspection reports have indicated that the feed water system is generally in good condition and identified repair/refurbishment to BFP 103. Without any available information to indicate that the BFP 103 has been repaired, PB Power recommends that this unit be overhauled similar to BFP 102 and 103. In addition, PB Power recommends that a comprehensive condition assessment of the complete feed water system shall be conducted in order to determine the current state of the system given the number of years of inactivity. The Table 4-3 below summarizes the condition assessment history of unit 10/100 feed water system conducted by LPI in November 2004.

Table 4-3 Feed Water Condition Assessment History Summary

	Comments

REDACTED

REDACTED

4.4 Unit 10/100 Water Treatment System

Review of latest water treatment system condition assessment, visual inspection of the equipment and interviews with key plant personnel has indicated that the existing softening plant system is in fair condition. However, the existing water treatment system cannot be utilized for the use of Unit 100 boiler. A new 4 x 33% train conventional cation/anion demineralised water system will be installed and the existing system to be removed completely.

4.5 Unit 10/100 Stack

As part of limited condition review of Unit 10/100, PB Power has reviewed available inspection and assessment report of the stack structure. Visual inspection of the structure and interview with plant personnel were conducted to identify potential safety and structural problems for reusing the Unit 100 boiler stack.

Based on the detail review of the condition assessment conducted in September 2002 by Gibraltar Chimney International, it appears that the Unit 100 stack structure is in generally satisfactory condition with minor repairs needed.

The Unit 100 stack was constructed in 1950 to serve the Unit 100 boiler. The stack is 329'-3" tall free standing, riveted steel construction which is superimposed on structural steel support framing. A comprehensive condition assessment of existing Unit 100 stack was conducted by Con Edison in September of 2002 to identify and document the existing condition of the stack structure. Gibraltar Chimney International was contracted to perform the condition assessment which focuses on three specific areas:

- Steel shell which acts as the structural component designed to resist all structural loads
- Gunite lining which serves to protect the steel shell from corrosive and thermal effects of the gases
- Various appurtenances such as clean out doors, ladder and cages, service platforms, sample ports, etc.

Gibraltar Chimney International condition inspection and assessment of the stack included the following:

- Non destructive visual inspection of stack interior and exterior and appurtenances
- Ultrasonic thickness measurement of the steel shell and liner
- Photographic documentation and
- Structural evaluation and recommend repairs

The Table 4-4 below is the summary of the stack structure condition inspection

Table 4-4 Stack Condition Inspection Summary

	Comments
	REDACTED

4.6 Unit 10/100 Electrical System

Generator # 10 has the capacity to produce 75kVA at 0.8 power factor at 13.8 KV which is equivalent to 60MW at 13.8 KV. The generator feeds a ring bus system through an auxiliary bus disconnect switch, the ring bus is composed of two separate buses, Auxiliary Bus 10-1 (South Bus) and Auxiliary Bus 10-2 (North Bus). Auxiliary Bus 10-2 could also be supplied from the 27kV power bus in the area through a tie circuit breaker and transformers. Power from the 27kV line is transformed with a 3750 KVA transformer to 460V, is used to supply Raw Water Pump # 102, Feed Water Pump # 105, Demin Water Pump # 102 and Air Compressor # 102. The 460 V bus is tapped and with a tie circuit breaker and a 3750 KVA, 13.8kV-440V transformer is used to supply the Auxiliary Bus 10-2. Generator # 10 also supplies the 27kV West Synch Bus through a 70,000kVA, 27kV-13.5kV transformer.

System Power Distribution

The 13.8 KV power at the North and South buses is stepped down to 440V to supply equipment on the Annex Building. All major motors on the system are rated 440V, including large motors which are usually supplied a higher voltage, the following large motors supplied at 440V:

- Boiler Feed Water Pump (FWP) 101, 102…….2250HP (each)
- FWP 104, 105, 105……..450HP (each)
- ID Fans 10N, 10S…….1250HP (each)
- FD Fans 10N, 10S……450HP (each)

Con Edison personnel indicated that in the 1950's the company decided to use 440V for equipment commonality. It was also indicated that large motors are no longer required to be supplied at 440V.

The Annex building essential power distribution equipment, distribution panelboards, circuit breakers, transformers, motor control centers (MCC) and associated equipment and feeders are located on the second floor of the building. Con Edison personnel indicated that when Unit 10/100 was retired on October 2004 all electrical equipment was operable. Plant personnel indicated that prior to the shutdown following equipment was replaced:

- Two (2) 1250kVA, 13.8kV-440V transformers associated with BF 101, these transformers were replaced with Olsun transformers 7 years ago
- The 4000A, 440V switchgear and buses associated with BF 101, this switchgear and associated buses were replaced 7 years ago
- The FDS S/S 1250kVA, 13.8kV-440V transformer was replaced with an Olsun transformer 7 years ago
- FDN S/S 2000kVA, 13.8kV-440V transformer was replaced with an Olsun transformer 5 years ago
- MN S/S 3550kVA 27kV-440V transformer was replaced 12 years ago. Currently this transformer is protected by a tarp due to a leak in the area where it is located. It is recommended the leak is fixed and a transformer drain shield is installed

The Annex second floor also contains a 150 KW, 480V diesel generator which was manufactured by Caterpillar. This generator is old and appears to be beyond its useful life. It does not comply with the latest efficiency and environmental regulations. The generator supplies panelboard B through a manual transfer switch.

In addition to the 150 KW generator, the building emergency power distribution system has a 20 KVA, 460 V UPS manufactured by Solid State Control. This UPS is dedicated to supply emergency power to the building AC unit. The UPS was installed in 2001 and is in good condition. The UPS has been located on a separate room. Its associated batteries are also in a separate room which is adjacent to the one containing the UPS.

The Annex building also has a 208/120V distribution system which is supplied from Auxiliary Bus 10-2 through a transformer. The system is divided into two separate distribution panelboards: L&P West Substation and L&P East Substation. The 208V system is dedicated to feed small HVAC load, lighting and miscellaneous small load like office equipment.

Lighting System

The Annex building lighting system is composed of a combination of incandescent, high intensive discharge (HID) fixtures and exit lights. Some of the exit lights are used as emergency lights and are provided with two heads incandescent lamps and batteries. Most fixtures are in good condition but many areas, especially on the basement, second and upper floors have uneven and on some cases low lighting level.

5.0 ANNEX UNIT UPGRADE DESCRIPTION

5.1 Plant Scope

The proposed upgrade of Unit 10/100 and installation of two (2) additional package boilers will comprise of the following new major items and services:

5.1.1 Upgrade of Annex Unit

Mechanical Scope

- Unit 100 boiler burner conversion
- Unit 100 boiler SCR and CO catalyst retrofit including:
  - Reactor housing with 2 x 50% NOx + 1 CO catayst
  - SCR reactor inlet and outlet ductworks including dampers and expansion joints
  - Reactor housing ductwork support structures
  - In duct pre-heat burner
  - New ID fan inlet ductwork including expansion joints, flow correction and interface
  - New ID Fans
  - SCR reactor housing access stair, platform and ladders
  - Urea/Ammonia conversion system
  - Boiler SCR system Interface
  - Boiler building ductwork penetrations/interface
  - Insulation
  - SCR electrical system, instrumentation and controls
  - Catalysts replacement manual hoist, trolley and monorail
- Unit 100 boiler economizer bypass banks replacement and repair of economizer supports
- Unit 100 boiler miscellaneous insulation/lagging repair
- Unit 100 boiler stack repair/modifications
- Unit 100 boiler fuel oil piping modification/upgrade
- Unit 10 steam turbine and valve repair/retrofit
- Unit 10 steam turbine control and instrumentation upgrade
- Unit 10 steam turbine hydrogen gas purity panel
- New Air cooled dump condenser
- New steam turbine full bypass system
- New LP deaerator
- New LP preheater
- New demineralized water system (4 x 33% Train)
- Retired No. 6 fuel oil tanks conversion for No. 2 fuel oil
- New fuel gas system
- Steam send out line upgrade/modification
- New instrument and service air system

5.1.2 Package Boilers

Mechanical Scope

- Two 292,000 lb/hr (gross steam output) shop assembled, dual fuel package boilers
- Package boilers low NOx burner system
- Boiler flue gas breeching
- Two SCR and CO catalyst system
- Urea to Ammonia conversion equipment and system
- Package boiler fuel gas system

- Package boiler fuel oil system
- Package boiler steam system
- Package boiler feedwater system
- Package boiler blowdown system
- Package boiler chemical dosing system
- Package boiler steam and water sampling system
- Package boiler service water system
- Package boiler instrument and service air system
- Package boiler bulk gas storage system
- Package boiler building drains system
- Package boiler building wastewater collection and disposal (including oily wastewater)
- Package boiler building fire safety system
- Package boiler HVAC system

5.1.3 Annex Unit and Package Boilers

Electrical Scope

- Medium voltage transformer
- Medium-voltage power distribution system
- Low-voltage power distribution system
- Control room
- Interconnection and tie-in with existing Con Edison power supply system
- Heat tracing
- Grounding and lightning protection system
- Indoor and area lighting system and receptacles
- Communications systems
- Raceway system (trays, conduits, etc.)
- Power, control and instrumentation cables
- Cathodic protection system
- Emergency generator

Instrumentation and Control Scope

- Distributed Control System (DCS)
- Combustion Control Systems for Boiler 100 and package boilers
- Burner Management Systems for Boiler 100 and package boilers
- Turbine Electro-Hydraulic Control system with dispatch capabilities
- Ovation Global Performance Optimizer
- Enterprise Data Server
- High-fidelity Simulator
- OPC server
- Emerson Asset Management System for instrumentation & control valves
- Switchyard and plant electrical controls
- Balance of plant controls
- Boiler tube metal temperature monitoring system
- Instrumentation, transmitters and primary sensors – for new processes and equipment only
- Control valves – only as indicated in attached drawings and bills of material
- Control room consoles and furniture
- Installation, start-up and commissioning
- Training of Con Edison personnel.
- Initial calibration

Buildings & Structures

- Package boiler building
- SCR reagent housing support structures
- ID fan inlet ductwork support structures
- Control room upgrade/modifications
- Demineralized water storage tank

Civil Scope

- Civil works including excavations, piling, foundations, bunds, drains, buildings, tanks, pipe and cable racks
- Temporary construction facilities
- Security fencing
- Roads and parking
- Landscaping

Demotion and Remediation

- Selective demolition of the west wall of the existing Annex building to accommodate the new SCR/CO system
- Demolition and removal of existing water treatment system
- Demolition and removal of existing Unit 10/100 control system
- Demolition and removal of ID fans, motors, electrical and base
- Demolition and removal of ID fans inlet ductwork and supports
- Removal and disposal of hazardous and non-hazardous materials
- Selective demolition of electrical items to be replaced

5.2 Mechanical

5.2.1 Unit 100 Boiler Burner Conversion

Part of the major refurbishment of Unit 100 boiler will be the conversion of the existing No. 6 oil burners to Low NOx burners designed to fire natural gas or No. 2 fuel oil. The new burners will be designed in conjunction with a new SCR system to lower emissions. PB Power's approach for the burner conversion is to have a well coordinated solution from the burner and SCR/CO system vendors in order to achieve the lowest emission level. It is anticipated that the existing FGR system will be retired permanently after the boiler burner conversion and retrofit of SCR/CO system.

The proposed new burners for Unit 100 are expected to provide the lowest possible NOx emission level for natural gas firing with improved turndown capability. Information provided by Todd has indicated that the proposed burner system would provide guaranteed total heat input of ***[REDACTED]*** MM Btu/hr firing natural gas and ***[REDACTED]*** MM Btu/hr on ultra low sulfur oil with a 10:1 turndown capability.

The new burners are designed to accept mechanical and/or steam oil atomizers presently used in most power plants. In general each burner will include the following components:

- Stationary air register assembly for primary and secondary air
- Pneumatic operated air slide assembly for primary/secondary air shut-off
- Tertiary air assembly
- Manually operated air slide assembly for tertiary air shut-off
- Piezometer ring assembly for airflow measurement
- Burner front hub assembly
- Gas burner assembly
- Gas/electric ignitor assembly
- Steam atomized oil burner assembly
- Burner Management System
- Adapter plate to be welded on the burner seal box front plate, as required for alignment of the burner
- Windbox frontplate adapter ring for proper fit and alignment of the burner to the windbox
- Mounting tools for alignment of windbox frontplate adapter ring to centerline of burner
- Burner refractory throat formers
- Spare oil gun assemblies
- Scaled flow test of the windbox and combustion air systems
- Flame scanning system

5.2.2 Unit 100 Boiler Miscellaneous Upgrade

Based on the boiler condition assessment conducted in 2004, the available major overhaul data in 1994 and discussions with Con Edison senior personnel, the following works to upgrade and refurbishment the Unit 100 boiler have been identified. PB Power expects that the boiler burner conversion (to gas and No. 2 fuel oil) and SCR/CO emission catalyst retrofit would be the major refurbishment works required for Unit 100 boiler.

- Boiler economizer bypass banks replacement
- Repair of economizer supports
- Repair and replacement of the boiler miscellaneous insulation/lagging
- Minor repair of exiting boiler stack repair and modifications to accommodate the package boilers
- Modification and upgrade of existing fuel oil piping modification

5.2.3 SCR and CO Catalyst System

Selective catalytic reduction (SCR) system and Carbon Monoxide (CO) catalyst system will be incorporated into Unit 100 boiler and package boilers' exhaust gas system to reduce NO_x CO and VOCs emissions over the full range of operation. The SCR system will be designed to further reduce the Unit 100 boiler NOx emissions to 5.6 ppmvd @ 3% O_2 for natural gas and to approximately 6.8 ppmvd @ 3% O_2 for No. 2 fuel oil and with a design of 5 ppmvd ammonia slip for gas and 10 ppmvd ammonia slip for No. 2 fuel oil. The SCR for package boilers will be designed to further reduce the NOx emissions to 5 ppmvd @ 3% O_2 for natural gas and to approximately 8 ppmvd @ 3% O_2 for No. 2 fuel oil and with a design of 5 ppmvd ammonia slip for gas and 10 ppmvd ammonia slip for No. 2 fuel oil. The CO catalyst system for Unit 100 boiler and package boilers will be designed with 80% to 85% oxidation efficiency.

The SCR system will be based on the use of an aqueous urea solution and includes urea to ammonia conversion equipment. The SCR system will include a urea storage tank for ten continuous days of operation or 1-1/2 truck loads whichever is greater, blowers, decomposition chamber, chemical pumping system and process controls. The package boiler SCR and CO systems are comprised of the following components and auxiliaries:

- One (1) urea unloading facility
- One (1) 30,000 gallon heated/insulated urea tank
- One (1) High flow circulation module
- One (1) Decomposition chamber
- One (1) Redundant injection metering module
- One (1) Distribution module
- Three (3) Injection assemblies
- Two (2) Dilution blowers
- One (1) Burner management and temperature control
- One (1) Fuel gas pressure control
- One (1) Fuel gas piping
- One (1) Process indication and control system
- NOx catalyst housing and supports
- CO catalyst housing and supports

The design and efficiency of the SCR and CO catalyst systems will be based on the air permitting requirements and base line emissions of the Unit 100 boiler and package boilers. Section 7.0 – Environmental Evaluation of the report provides a comprehensive analysis of the emissions netting based on the base line emissions provided by the Unit 10 burner manufacturer and package boiler vendors.

PB Power has contacted three (3) leading SCR and CO system/equipment vendors (i.e. Peerless, CSM and Enviro Kinetics) to provide technical assistance and proposals for the retrofit of SCR and CO Catalyst system into the existing Unit 100. This effort has been undertaken in close coordination with the burner vendor for conversion of the existing burners to natural gas and No. 2 fuel oil firing.

Three (3) technologies are commercially available for delivery and distribution of ammonia into the SCR system namely anhydrous ammonia system, aqueous ammonia system and aqueous urea system. Con Edison indicated the preference for an SCR system based on aqueous urea solution technology to deliver ammonia to the catalyst NOx emission control.

The aqueous urea provides ammonia for the SCR systems by decomposing urea to feed the traditional ammonia injection grid (AIG). In contrast to anhydrous and aqueous ammonia systems, the urea products are considered a non-hazardous source of ammonia, thus transport and storage is much simpler. The urea system relies on post combustion reactions in a chamber designed to control urea decomposition in a specified temperature window of 600 ^{O}F to 1000 ^{O}F. The system includes urea storage, blower, decomposition chamber, chemical pumping system and process controls.

In an aqueous urea system, filtered ambient air is fed into the chamber by blowers. Automatic control dampers are used to control discharge flow and pressure. The aqueous urea solution is supplied by a storage pumping system and is sprayed to post combustion gases through injectors. The urea is then efficiency converted to ammonia in the decomposition chamber to feed the AIG. The control of urea injection will be based on the load signal with feedback from the NOx analyzer/CEMS.

The Unit 100 boiler and the two (2) package boilers aqueous urea to ammonia conversion system will be combined. The expected ammonia requirement of the existing Unit 100 boiler and two (2) package boilers is approximately 270 lb/hr.

The drawings ME3A-03 and ME3A-04, illustrate the proposed layout of the SCR/CO system retrofit into the existing Unit 100.

Based on the SCR retrofit arrangement, PB Power anticipates that the following specific modifications to the existing flue gas system will be conducted to accommodate the installation of the SCR and CO Catalyst systems.

REDACTED

SCR LAYOUT PLAN

ME3A-03

REDACTED

SCR LAYOUT ELEVATION

ME3A-04

REDACTED

5.2.4 Unit 10 Steam Turbine Generator

REDACTED

5.2.5 Unit 10/100 Steam System

REDACTED

REDACTED

5.2.6 Package Boiler System

REDACTED

REDACTED

5.2.7 Feedwater System

REDACTED

REDACTED

5.2.8 Chemical Injection Systems

REDACTED

5.2.9 Blowdown System

REDACTED

5.2.10 Water Treatment System

REDACTED

REDACTED

5.2.11 Fuel Supply System

Fuel Gas System

REDACTED

Fuel Oil System

REDACTED

5.2.12 Service and Instrument Air System

REDACTED

5.2.13 Sampling and Analysis System

REDACTED

5.2.14 Process Bulk Gas Storage and Distribution System

REDACTED

5.2.15 Wastewater Collection, Treatment and Discharge Systems

REDACTED

5.2.16 Fire Protection System

[REDACTED]

5.2.17 Heating, Ventilating, and Air Conditioning System

REDACTED

5.3 Electrical

REDACTED

REDACTED

5.4 Instrument and Controls

5.4.1 Existing Unit 100 Boiler 100/ Turbine 10 Controls

REDACTED

5.4.2 Distributed Control System

REDACTED

REDACTED

5.4.3 Boiler 100 Combustion Control System

REDACTED

5.4.4 Boiler Tube Metal Temperature Monitoring

REDACTED

5.4.5 Station Steam Sendout/Dump Controls

REDACTED

5.4.6 Boiler 100 Burner Management System

REDACTED

5.4.7 Switchyard Controls

REDACTED

5.4.8 Package Boiler Controls

REDACTED

5.4.9 Balance of Plant Controls and Monitoring

REDACTED

5.4.10 Turbine Electro-Hydraulic Control – Upgrade/Replacement

REDACTED

5.4.11 Instrumentation

REDACTED

5.4.12 Control Valves

REDACTED

5.4.13 Instrument Racks

REDACTED

5.4.14 Miscellaneous

A complete Instrumentation and Control system for the Annex and package boiler plant as described in this section will be provided including system installation, start-up and commissioning, O&M training of Con Edison personnel and initial calibration.

5.5 Civil, Structural and Architectural

The upgrade of Unit 10/100 and installation of package boilers will include the following main civil, structural and architectural activities:

- Site Investigation
- Site Improvements
- Demolition and Remediation
- Site Drainage
- Building and Support Structures
- Foundations
- Steel Structures
- Concrete Structures
- Miscellaneous Buildings and Structures

5.5.1 Design Basis

The design, fabrication, installation and testing of all civil, structural and architectural components will conform to the New York City Building Code, NYS Uniform Fire Prevention and Building code, NYS Energy Conservation Code, ADA Requirements and to the following codes and standards:

- American Society of Civil Engineers
- American Concrete Institute :
- American Institute of Steel Construction
- American Welding Society
- American Association of State Highway and Transportation Officials
- American Society for Testing and Materials
- Underwriters Laboratory (UL) Codes and Standards
- American Water Works Association
- United States Department of Agriculture, Natural Resources Conservation Service
- State of New York Department of Transportation
- National Fire Protection Association
- Council of American Building Officials
- Research Council on Structural Connections
- National Association of American Metal Manufacturers
- U.S. Department of Labor, Occupational Health and Safety Administration

5.5.2 Site Investigation

Site investigation will provide topographical and geotechnical information and verifications of the drawings and other data relating to the existing plant and will be used for layout and design of systems structures and foundations for the proposed plant extension.

Geotechnical survey will be carried out to obtain data to establish the design criteria for all foundations, underground structures, soil retaining structures and earthworks.

Portions of the existing Unit 10/100 building that are expected to be demolished, modified or affected will be investigated prior to start of any work

5.5.3 Site Access

The existing public and private roads in the vicinity of Annex building to be used as construction access will be checked to verify suitability for the anticipated construction traffic loading. The existing unloading dock north of the station will be utilized for large equipment and materials.

5.5.4 Site Improvements

It is anticipated that the following site improvements will be conducted as part of the scope of work for upgrading Unit 10/100 and installation of package boilers.

- Demolition and Site Clearance

Selective demolition of existing water softening plant, ID fans, motors and auxiliaries, precipitator ductworks and supports, associated electrical equipment, equipment bases to slab on grade and related structures will be part of site clearance. Contaminated soil will be excavated and disposed to an approved disposal area. Site clearance will be done to obtain free space required for the retrofit of the SCR/CO system and installation of package boilers.

- Bulk Excavation and Site Grading

The areas of the site affected by the work will be excavated, filled and graded to match the levels established for the existing Annex building. The edges of all filled and excavated areas will be sloped and drained to give stable profiles. Excess excavated material will be disposed off in approved areas outside the site boundary.

- Site Roads, Paved Areas, Yard Surfacing and General Area Paving

The existing road between the Annex building area and proposed package boiler building is anticipated to be improved. Paved areas and yard surfacing will be included to provide suitable surfaces for vehicular and pedestrian traffic access to new package boiler building. Road and paved areas will be designed so as to clear water from the surface of the roads. All site surfaces except that occupied by buildings, roads or concrete paving will be paved gravel to prevent erosion by wind or rain.

- Site Security

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- Site Drainage

A site drainage system in the package boiler building area will be provided. The drainage system will be connected to existing facility drainage system. The storm drainage will be constructed as part of package boiler building facility to collect all runoff and discharge existing drainage system.

5.5.5 Building and Structures

The two (2) package boilers auxiliaries will be housed in a new building to be located adjacent to the existing Annex building across John Street. The building will consist of a structural steel framed structure totally enclosed with an insulated metal wall and roofing system. The building structure will be designed to support the load of the new air cooled dump condenser.

The operating floor will be concrete with heavy duty or quarry tile floor finish or concrete and coated with heavy duty non-skid paint, hardener. Note the structure to support the dump condenser with ;package boiler building later as needed.

The package boiler building superstructures will consist mainly of structural steel frames with concrete, chequered plate or open steel grating floors as appropriate. Walls and roofs will be clad with coated profiled metal sheets which will be insulated for enclosed buildings and structures and un-insulated for open structures. Building substructures and in-ground structures will consist of reinforced concrete. Other buildings and structures consist of the following:

- Package boiler and auxiliary equipment foundation and supports
- SCR/CO reagent housing and ductwork support structures
- FD Fan inlet ductwork support structures
- Package boiler stack, breeching and support structures
- New demineralized water tank foundation
- Transformer foundations and oil containment area.
- Cable trenches and ducts
- Cable racks & culverts
- Fuel transfer pumps and forwarding pumps foundations and shelters
- Pipe racks and pipe supports
- Shelters, sunshade and canopy for outdoor installations

Structures supporting rotating or reciprocating equipment will be designed for dynamic loading and will be designed such that the natural frequency of the equipment-structural system is not within the range of +/-20% of the equipment operating frequency. The load combinations for which the building or structure is to be designed will be as per ANSI A58.1.

5.5.6 Foundations

All design loads shall meet the minimum requirements of the New York City Building Code. Dead Load shall include the weight of all permanent construction materials and equipment including permanent hung loads. Minimum live loads shall be in accordance with New York City Building Code.

Foundations of building, structures or equipment will be designed to resist all design loads. The foundations will be proportioned so that the calculated total and differential movements of the foundation are not greater than the movement that the building, structure or equipment is designed to accommodate. Foundation for equipment will be designed to limit settlement to the lesser of the values specified by the manufacturer of the equipment or to the limits which can be tolerated by the external connections to that equipment.

5.5.7 Steel Structures

The steel structures will be designed in accordance with the requirements of AISC, Manual of Steel Construction. The structures will be designed to support the specified loading and will be adequate for the intended function of the structure.

5.5.8 Concrete Structures

Concrete structures will be designed in accordance with the requirements of ACI 318, ACI 301 and New York City Building Codes. The structures will be designed to support the specified loading and will be adequate for the intended function of the structure.

All the trenches, manholes, catch basins and pits will be doubly reinforced. The reinforcement will be epoxy paint coated. In order to avoid water infiltration, all the construction joints to the structures will be provided with approved water stops.

5.5.9 Miscellaneous Buildings and Structures

- Transformer Foundation / Enclosures

Oil filled transformers will be located at minimum distance required by New York City Building Code and relevant standards from buildings, other transformers, or structures susceptible to damage from oil fires. Wherever this separation cannot be maintained firewalls will be provided as described below.

Each containment basin will be a concrete, liquid tight, open top basin-like structure which will surround the transformer for which containment is provided. The space within the basin will be filled to the level of the adjacent finished grade with a free draining crushed or washed stone.

Firewalls will be provided to protect adjacent areas from explosion and radiant heat wherever the minimum separation cannot be maintained due to layout restrictions, or where required for protection of personnel, high value equipment, emergency exit routes, or openings into adjacent buildings.

- Cable Trenches

The size and construction details of the trenches and access structure will be similar to the existing installations. Cable ducts will have complete assemblies of conduits in a concrete surround. The conduits will be constructed of rigid steel. There will be at least ten percent or four spare conduits in each duct.

6.0 LIST OF MAJOR EQUIPMENT

The upgrading of Unit 10/100 and addition of two (2) package boilers to provide 1,600,000 lb/hr of net steam send out includes the addition and installation of new major mechanical, electrical and control equipment and systems.

The approach we have taken has been to identify all equipment and systems in Unit 10/100 that will be removed and replaced with emphasis on the major items considered to be critical for upgrading the facility. The equipment rating on the major equipment is based on our understanding of the available process data of Unit 10/100, technical information from Phase 1 Study and the technical criteria set by Con Edison.

The Table 6-1 below represents the major equipment for Option 3A.

OPTION 3A
UPGRADE OF ANNEX UNIT AND ADDITIONAL PACKAGE BOILERS
LIST OF MAJOR EQUIPMENT

Table 6-1
OPTION 3A – UPGRADE OF EXISTING ANNEX UNIT MECHANICAL EQUIPMENT LIST

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	POTENTIAL VENDOR	SPEC	MTRL	CAPACITY	TYPE	ELEC MOTOR	ELEC DATA	COMMENTS

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	POTENTIAL VENDOR	SPEC	MTRL	CAPACITY	TYPE	ELEC MOTOR	ELEC DATA	COMMENTS

REDACTED

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	POTENTIAL VENDOR	SPEC	MTRL	CAPACITY	TYPE	ELEC MOTOR	ELEC DATA	COMMENTS

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	POTENTIAL VENDOR	SPEC	MTRL	CAPACITY	TYPE	ELEC MOTOR	ELEC DATA	COMMENTS

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	POTENTIAL VENDOR	SPEC	MTRL	CAPACITY	TYPE	ELEC MOTOR	ELEC DATA	COMMENTS

REDACTED

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	POTENTIAL VENDOR	SPEC	MTRL	CAPACITY	TYPE	ELEC MOTOR	ELEC DATA	COMMENTS

REDACTED

OPTION 3A – UPGRADE OF EXISTING ANNEX UNIT ELECTRICAL EQUIPMENT LIST

EQUIP TAG NO	EQUIP DESCRIPTION	SYSTEM	VOLTAGE	SPEC	PHASE	AMPERAGE	FREQ	NEMA	KAIC	COMMENT

6.1 Tie-in Connections

The major infrastructures for the power supply, oil storage, steam, feed water, service water, fire protection and drainage is already available in the Annex building. The natural gas fuel supply is not currently available at the site. It is assumed that the future gas supply line will be within the boundary of the Annex Building property. The new equipment, piping, electrical system and controls for upgrade of Unit 10/100 and package boilers tie-ins to the existing facility will be made to the nearest available and practical points possible. Table 6-2 below summarizes the expected tie-in connections:

Table 6-2 Tie-In Connections Summary

DESCRIPTION	FROM	TO
Fuel Gas Supply		
No. 2 Fuel Oil Supply		
Steam Turbine Bypass		
Dump Condenser		
Package Boiler Steam Send out		
Electrical Supply		
Control System		
Feed Water Supply		
Compressed Air		
Fire Protection		
City Water Supply		
Wastewater		

REDACTED

7.0 ENVIRONMENTAL EVALUATION

7.1 Overview

This chapter includes the environmental assessment of Option 3A (the Annex upgrade and the installation of two new boilers) that would replace the existing Low Pressure (LP) Boilers (71, 72, 81 and 82) at the HA Station. As part of the Annex upgrade, Boiler 100 would be reconfigured with less polluting fuels and additional pollution controls; the existing LP Boilers would be retired. Refer to Appendix V for a list of acronyms and abbreviations. The environmental workscope for this effort includes the following items:

- Identify the environmental permits / approvals required for the construction of Option 3A and the schedule required to obtain these permits / approvals;
- Determine the air quality regulations that apply to the Boiler 100 upgrade/ new boilers;
- Demonstrate that the Boiler 100 upgrade/ new boilers will comply with all federal and New York State (NYS) air quality regulations;
- Perform netting of emissions based on the retirement of existing equipment and the installation of new boilers;
- Perform air dispersion modelling for emissions from the Boiler 100/ new boilers especially related to impacts resulting from emissions of nonattainment pollutants (particulate matter with diameters ≤ 10 microns [PM_{10}] and particulate matter with diameters ≤ 2.5 microns in size [$PM_{2.5}$]);
- Determine the need for a State Pollutant Discharge Elimination System (SPDES) permit modification;
- Estimate disposal costs associated with waste (hazardous and non-hazardous) that is excavated in the footprint for Option 3A;
- Discuss the City and NYS Environmental Quality Review process;
- Describe the Title V changes / modifications under the NYS permit program;
- Discuss the NYS and federal requirements for an Environmental Justice (EJ) review;
- Provide a cursory estimate of noise impacts and the general approach to noise compliance; and
- Discuss the elements of a public outreach program.

Based on a review of the Option 3A equipment (Boiler 100 upgrade and two new net 250,000 lb-steam/hr boilers), engineering information and internal direction from Con Edison, the following assumptions were made in the environmental evaluation:

- Limit the study to the use of natural gas and low sulfur distillate (LSD) or ultra low sulfur distillate oil (ULSD). Use natural gas as the primary fuel and 720 hours of LSD/ULSD oil as the backup fuel.

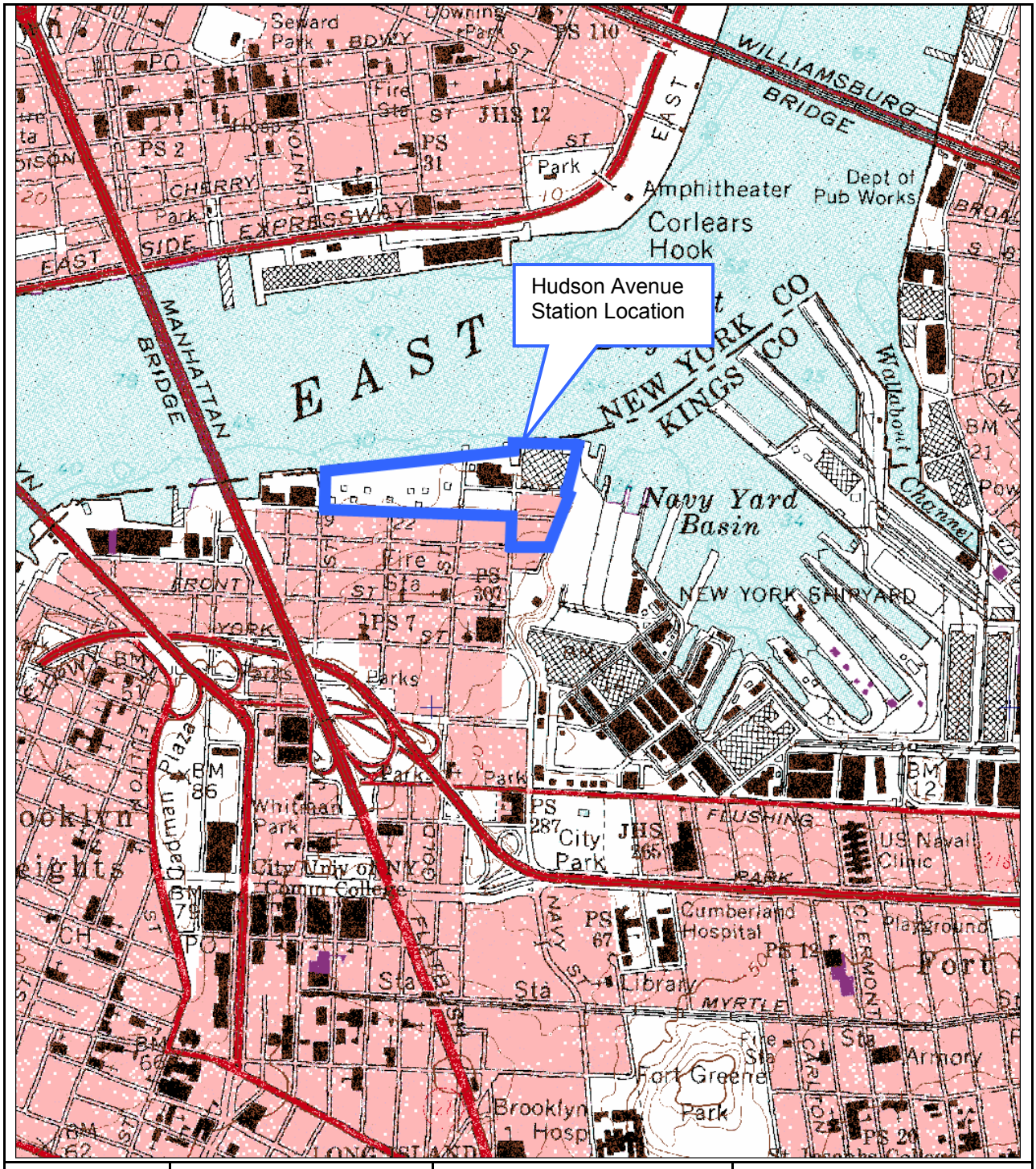
REDACTED

7.1.1 Background

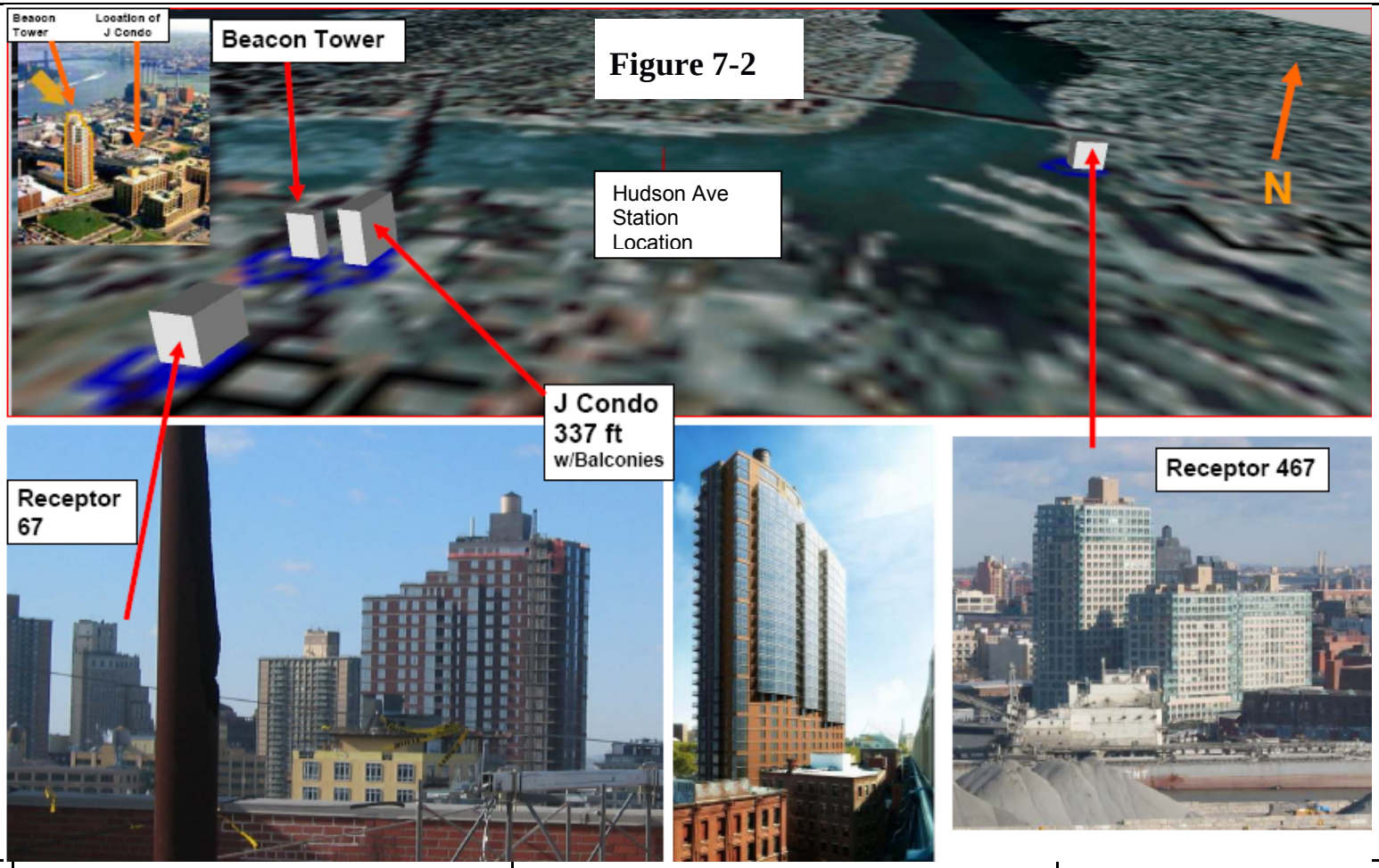
7.1.1.1 Hudson Avenue Station Neighborhood Setting

The HA Station is located in Brooklyn (Kings County) and is bounded to the north and south by the East River and Plymouth Street, respectively. The HA Station location outline on a topographic map is displayed on Figure 7-1. East of the site are the New York City Department of Environmental Protection (NYCDEP) sewage treatment plant (which is adjacent to the HA Station) and the former Brooklyn Navy Yard (which is now the home of numerous industries and a power plant). West of the HA Station is the Farragut Substation, also owned by Con Edison.

The HA Station is a large facility surrounded by a mix of industrial buildings, as well as low-rise and high-rise housing. A recent improvement in the real estate market has resulted in a proliferation of high rise residential buildings and general development within 2 miles of the HA Station, such as Brooklyn Bridge Park, two proposed high-rise residential towers on Gold St., and conversion of former office buildings into residential towers (e.g., located at 110 Livingston St. and 101 Willoughby St.). Several high rise residential buildings (Beacon Tower, J Condominium, etc.) have been recently constructed in the vicinity and their locations relative to the HA Station are displayed on Figure 7-2. Many of these residential buildings have outdoor balconies and terraces with views of the Manhattan skyline (refer to Figure 7-3, which displays the balconies on J Condominium). The closest residences are adjacent (across the street) from the southern property line. A school and a church are also located near the HA Station. The nearby “Admiral’s Mansion” and the Vinegar Hill residential district have landmark status. In addition, narrow cobblestone streets near the site are considered to be historically significant. These streets may not be suitable for large vehicles and / or a significant increase in traffic. Access by barge for delivery of major equipment components is an option.



	Consolidated Edison Company of New York, Inc. July 2007	**Location of Hudson Avenue Station** Source: USGS Topographic Map	Figure 7-1 www.ensr.aecom.com



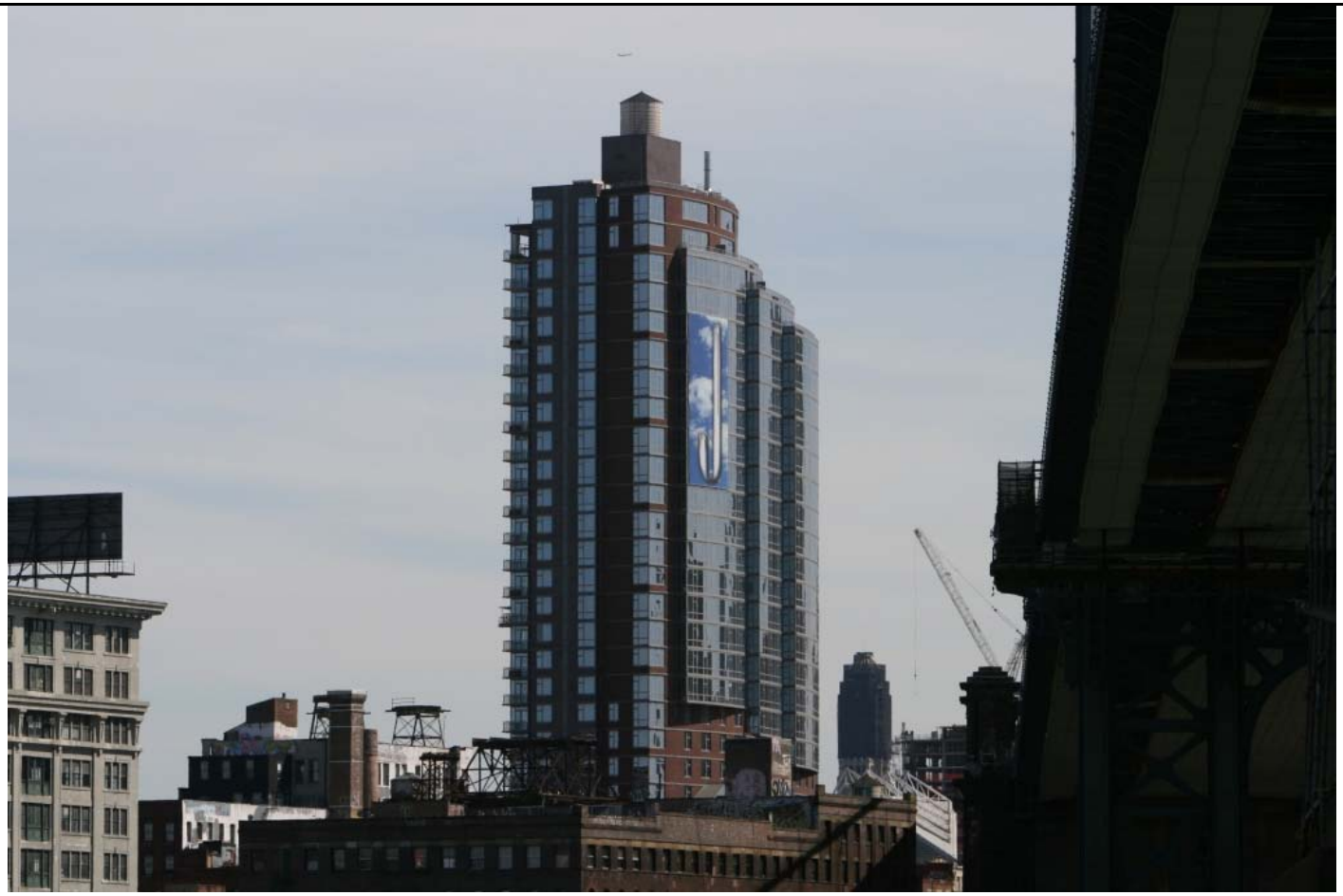
Consolidated Edison Company of New York, Inc

July 2007

Nearby High-rise Residential Buildings

Figure 7-2

www.ensr.aecom.com



	Consolidated Edison Company of New York, Inc July 2007	**J Condominium**	Figure 7-3 www.ensr.aecom.com

7.1.1.2 Existing Equipment Configuration

The following provides a summary of the physical and functional equipment configuration located at HA Station. There currently is no substantial gas supply at this Station, except for ignition gas to the now retired Boiler 100. There are four (4), low pressure, natural circulation, balanced draft, non-reheat boilers, which burn No. 6 oil (up to 0.3% Sulfur) and have a net steam sendout capability of 400 thousand pounds per hour (Mlb/hr) each. These units were commissioned in 1932. Boiler 100, with an in-service date of 1951, had been retired in August 1997 and was re-activated in 2001 to meet anticipated short term demand. The new operating permit for Boiler 100, issued in 2001, expired on October 1, 2004 and Con Edison again retired the unit for a second time. When operating, Boiler 100 generated approximately 60 MW of electricity and up to 1.1 MMlb/hr net steam. Three peaking gas turbines firing distillate with a capacity of 14 MW each are also located at the HA Station.

A view of the HA Station from Manhattan is displayed on Figure 7-4. The existing LP Boilerhouse is located on the left side of the photo and the Annex building containing Boiler 100 is the red building on the right. As shown on this image, the three additional stacks shown on older photographs have been removed from the boilerhouse (the building with the sign “SELF STORAGE” is not part of the HA Station). The Annex building height is 156 ft above grade and the Boiler 100 stack (EP00005) height is 356 ft above grade. The LP Boilerhouse height is 144 ft above grade (without an upper tier that would be removed – see Figure 7-4) and the LP Boilerhouse stack (EP00004) is approximately 377 ft above grade.

7.1.1.3 Historical HA Station Operation and Steam Sendout

To obtain a perspective on the HA Station operation, annual emissions from the equipment operation (Boiler 100 and LP Boilers) on No. 6 oil (0.3% S) based on steam demand were compiled for the period 2001-2006 (emissions from the peaking gas turbines were excluded). The emissions were sorted into two year averages by Boiler 100 and the LP Boilers for regulatory purposes over the two most recent (2004-2005 and 2005-2006) two-year average periods as presented in Table 7-1. Emissions for criteria pollutants were obtained from annual emission statements provided by Con Edison, while CO_2 emissions were calculated based on published factors. $PM_{2.5}$ emissions were calculated based on AP-42 published factors for residual oil.

Two events have occurred since 2004 that affected the steam demand for the HA Station and the emissions resulting from equipment operation. Boiler 100, which was reactivated in 2001, was retired in October 2004. In addition, the East River Repowering Project (ERRP) at the East River Station in Manhattan commenced operation in May 2005. The ERRP is a new truncated combined cycle project that is baseloaded for steam sendout to the extent practicable. The ERRP injects up to 3.0 MMlbs per hour of steam into the steam system, and this supply can alter the dispatch of other steam stations.

There is a significant decrease in emissions (about 35 percent) at the HA Station for 2006 when compared to the previous five years of emissions data. A cursory check of heating and cooling degree days for the 2004 through 2006 period indicates that 2004 and 2005 were near normal while 2006 had a significantly lower than average (16 percent or 767 degree days lower) heating degree day total. The lower heating degree day total would have resulted in lower steam demand, which in turn would have lowered the HA Station emissions for 2006.
[REDACTED]

	Consolidated Edison Company of New York, Inc July 2007	**View of HA Station from Manhattan**	Figure 7-4 www.ensr.aecom.com

Table 7-1 Annual Emissions form Hudson Avenue Station
Data for Hudson Avenue Station Process ROL - Emissions from LP Boilers Residual Fuel Consumption*

Residual Oil Data	**Units**		**2006**	**2005**	**2004**	**2003**	**2002**	**2001**	**Min**	**Max**	**Average**
Heat Value	Btu/gal		148,980	148,813	149,386	149,345	150,005	150,457	148,813	150,457	149,498
Sulfur Content	%		0.26	0.27	0.28	0.29	0.28	0.28	0.26	0.29	0.28
% Fuel - Jun-Aug	%		29.1	23.3	24.0	25.4	16.1	23.0			
% Fuel - Sep-Nov	%		6.3	18.4	19.8	20.0	28.2	16.6			
No. 6 Oil - Residual	Mgal		16,709.5	31,153.1	30,026.5	31,811.9	28,930.0	40,541.6	16,709	40,542	29,862
Emissions	**Units**	**Basis**	**2006**	**2005**	**2004**	**2003**	**2002**	**2001**	**05-06 Avg**	**04-05 Avg**	**01-06 Avg**
CO	tpy	AP-42	42.320	78.812	76.248	80.389	73.688	103.696	60.6	77.5	75.9
SO2	tpy	%S	373.407	695.398	672.772	709.317	650.187	914.966	534.4	684.1	669.3
PM10	tpy	AP-42	34.540	65.970	63.824	67.291	61.681	86.800	50.3	64.9	63.4
PM2.5			28.462	54.519	52.745	55.610	50.975	71.733	41.5	53.6	52.3
PM	tpy	AP-42	43.564	83.448	80.733	85.118	78.023	109.796	63.5	82.1	80.1
NOx	tpy	CEMS	256.406	635.130	598.767	612.377	632.849	896.667	445.8	616.9	605.4
VOC	tpy	AP-42	6.348	11.822	11.437	12.059	11.053	15.555	9.1	11.6	11.4
CO2	tpy	AP-42	208,869	389,414	375,331	397,649	361,625	506,771	299,141	382,372	373,276
CO	lb/MMBtu	AP-42	0.0340	0.0340	0.0340	0.0340	0.0340	0.0340			
SO2	lb/MMBtu	%S	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000			
PM10	lb/MMBtu	AP-42	0.0285	0.0285	0.0285	0.0285	0.0285	0.0284			
PM2.5	lb/MMBtu	AP-42	0.0235	0.0235	0.0235	0.0235	0.0235	0.0235			
PM	lb/MMBtu	AP-42	0.0360	0.0360	0.0360	0.0360	0.0360	0.0360			
NOx	lb/MMBtu	CEMS	0.2060	0.2740	0.2670	0.2920	0.2920	0.2940	0.2400	0.2705	0.2708
VOC	lb/MMBtu	AP-42	0.0051	0.0051	0.0051	0.0051	0.0051	0.0051			

*Based on HA Annual Emission Statements for 2001 through 2006 provided by Con Edison

7.2 Description of Option 3A – Annex Upgrade and Two Package Boilers

7.2.1 New Boilerhouse Footprint

Con Edison intends to replace the four LP Boilers (71, 72, 81 and 82) that are individually capable of producing approximately 400,000 lb net steam per hour for a total maximum output of 1.8 MMlb steam per hour for the HA Station. Numerous alternatives for new steam generation equipment were investigated (Worley Parsons, October 2006); one option involves upgrading Boiler 100 and two new replacement boilers ("Option 3A") to achieve this steam output.

The layout of existing structures on the HA Station site and the Option 3A proposed footprint is displayed on Figure 7-5. Note that this is an older photo and significant structures have been removed (e.g. three stacks from the LP Boilerhouse). The footprint for the Option 3A project, Annex upgrade / two new package boilers, would be located to the south of the existing LP Boilerhouse. The existing 356 ft stack at the Annex boilerhouse would exhaust the flue gas from an upgraded Boiler 100 and the two new 367 MMBtu/hr boilers. The construction of Option 3A would not entail the removal of any existing structures except those directly under the footprint. Because the HA Station has only minimal gas service available (for ignition of boilers), a new gas line will be installed in Brooklyn that will have the capacity for fueling the new boilers at their rated capacity.

7.3 Option 3A – Annex Upgrade and Two Package Boilers

Option 3A consists of restarting and upgrading Boiler 100 to achieve a heat input of ***[REDACTED]*** MMBtu/hr and add two new boilers of ***[REDACTED]*** MMBtu/hr heat input that will provide supplemental steam for high demand periods. The total maximum net steam output for Option 3A is ***[REDACTED*** MMlb-steam per hour. These three boilers would be fired primarily with natural gas and would be permitted to fire either LSD (0.047% S) or ULSD (0.0015% S) for up to 720 hours per year. This backup oil use may be limited to the winter months (December through February) when natural gas is in high demand. Boiler 100 is contained within the Annex building and the upgrade would require modification of the Annex for pollution control equipment. The two smaller boilers would be installed in a new boilerhouse located between the Annex building and the existing LP boilerhouse. All equipment would vent into the single flue, the 356 ft stack that served the former Boiler 100 (see Figure 7-5 for approximate stack and footprint locations). Boiler 100 will also have the capability of producing up to***[REDACTED*** MW of electricity and the Boiler can be run for electricity production even when steam sendout is minimal. A full flow steam turbine bypass is also a possible operating mode. An air-cooled dump condenser will be installed to dissipate waste heat from the back-end steam turbine used for electrical production.

The Boiler 100 upgrade and the two new boilers would be designed with the following pollution control measures:

- SCR and LNB for nitrogen oxide control;
- Oxidation catalyst for CO and VOC control;
- Natural gas which is lowest polluting fossil fuel; and
- LSD (0.047% S) or ULSD (0.0015% S) for SO2 and particulate control.

Emission estimates for Option 3A were developed for use in the emissions "netting" analysis (refer to section 7.4.19) and in the dispersion modeling analysis (performed using AERMOD, refer to section 7.4.20). These estimates accounted for fuel use (natural gas and LSD or ULSD), the addition of pollution controls, and the conversion of sulfur dioxide emissions to particulate sulfate and sulfuric acid. Emission factors for the boilers were derived from supplied vendor information, ENSR experience obtained through permitting other boiler projects, engineering judgment based on

available information, and published emission factors (e.g., AP-42). A summary of the basis for emissions for Option 3A is presented for Boiler 100 and the two new package boilers in Table 7-2.

7.4 Air Quality Regulations, Permitting and Analyses

7.4.1 Air Quality Regulations Overview

There are very stringent design constraints imposed on sources of air pollution emissions by federal, state, and local laws, regulations, and guidelines especially due to the nonattainment designations for $PM_{2.5}$ and ozone at the HA Station location and for the nearby PM_{10} area in Manhattan. Those regulations include the following:

- National and State Ambient Air Quality Standards (40 Code of Federal Regulations [CFR] Part 50; 6 New York Code of Rules and Regulations [NYCRR] Part 257);
- New York State Implementation Plan (SIP) for sulfur dioxide (SO2) (6 NYCRR Part 225-1.2), particulate matter (PM) and NOx (6 NYCRR Part 227);
- Federal Emissions Standards codified in 40 CFR Part 60 (New Source Performance Standards [NSPS]): Subpart Db (Industrial-Commercial-Institutional Steam Generating Units) as amended in the February 27, 2006 Federal Register (with additional amendments proposed on February 9, 2007);
- Nonattainment New Source Review (NNSR) Regulations (40 CFR Section 52.24; 6 NYCRR Part 231-2); proposed 2006 amendments to Part 231 (Subparts 231-3 though 231-13);
- Prevention of Significant Deterioration (PSD) Regulations (40 CFR Section 52.21);
- New York State Title V Permit Requirements (6 NYCRR Part 201-6);
- Maximum Achievable Control Technology Requirements (40 CFR Part 63; Section 112(g) of the Clean Air Act);
- Risk Management Plan Requirements (40 CFR Part 68; Section 112(r) of the Clean Air Act);
- Federal and New York State Acid Deposition Control Requirements (40 CFR Parts 72, 73 and 75; NYS ECL Title 9);
- Compliance Assurance Monitoring Requirements (40 CFR Part 64);
- New York State Air Toxic Emission Guidelines;
- Federal Environmental Justice Analysis (Presidential Executive Order 12898); and
- New York City Air Pollution Control Code Requirements.

The following sections discuss specific requirements applicable to each item in the above list.

	Consolidated Edison Company of New York, Inc July 2007	**HA Station Existing Stacks and Option 3A Stack Location** Note that this is an older photo and some structures at the Station have changed *Source: GoogleEarth*	Figure 7-5 www.ensr.aecom.com

Table 7-2
Basis For Emissions From Option 3A
Boiler 100 and 2 X 250,000 lb/hr Boilers (Net Each)

Notes:
1) Boiler data based on heat input of 586 MMBtu/hr for one boiler; oil emission rates are LSD unless stated as ULSD
2) Values of PM_{10} and $PM_{2.5}$ for each package boiler on No. 2 Fuel Oil (LSD) are estimated based on Boiler No. 100 PM_{10} and $PM_{2.5}$ emission rates on oil. Values of PM_{10} and $PM_{2.5}$ on NG are from boiler vendor.
3) Values of VOC for each package boiler on No. 2 Fuel Oil are estimated based on Boiler No. 100 VOC emission rates on oil.
4) No credit is taken for VOC reduction due to oxidation by CO catalyst.
5) CO_2 for gas based on 2.75 lbs CO_2 per lb methane
6) CO_2 for oil based on 3.19 lbs CO_2 per lb No 2 oil ((87% C)
7) HHV Nat Gas 21824 Btu/lb
8) HHV No. 2 Oil 19500 Btu/lb

Source: PB Power (April 2007)

7.4.2 National and State Ambient Air Quality Standards

The Clean Air Act of 1970 required the USEPA to establish ambient ceilings for certain compounds based upon the identifiable effects the compounds may have on the public health and welfare. Subsequently, the USEPA promulgated regulations that set National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants: sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$) lead (Pb), and ozone (O_3). Two classes of ambient air quality standards have been established: (1) primary standards defining levels of air quality that the USEPA has judged as necessary to protect public health; and (2) secondary standards defining levels for protecting soils, vegetation, wildlife, and other aspects of public welfare.

New York State has adopted the federal standards for some criteria pollutants, promulgated more stringent standards for others, and promulgated additional standards for some non-criteria pollutants. In addition, the NYSDEC has retained the previous NAAQS for total suspended particulates (TSP) that were replaced by the PM_{10} standards in 1987. Table 7-3 lists the applicable ambient air quality standards.

The HA Station is located in Kings County within the New Jersey/New York/Connecticut Interstate Air Quality Control Region (AQCR). Kings County is currently designated by the USEPA as an attainment area for SO_2, CO, PM_{10}, and NO_2; undesignated for Pb; and nonattainment for O_3 (moderate) and $PM_{2.5}$. The current PM_{10} designation is moderate nonattainment in nearby Manhattan. The site of the proposed Project is located in an area that was recently designated nonattainment of the NAAQS for $PM_{2.5}$. The nonattainment designations were published as a final rule in the January 5, 2005 Federal Register, and NYC, Long Island and portions of CT and NJ are within the same $PM_{2.5}$ nonattainment area. The attainment status of the region, along with the projected emission rates, determines the regulatory review process.

Ozone

On July 17, 1997, the USEPA promulgated a new NAAQS for O_3. With this action, the USEPA phased out the previous 1-hour primary standard (health based) with a new 8-hour standard to protect against longer exposure periods. The 1-hour ozone standard was revoked by the USEPA on June 15, 2006 for all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas. There are no EAC areas in New York or New Jersey.

The HA Station is located in an area that had been designated severe nonattainment of the revoked 1-hour ozone standard and that is designated moderate nonattainment of the 8-hour ozone standard. Although the federal designation is moderate nonattainment relative to the 8-hour ozone standard, existing NYS regulations governing new source review in the NYC and Long Island area are based on the severe nonattainment designation relative to the 1-hour ozone standard. Since NYS regulates NNSR in accordance with 6 NYCRR Part 231, the 1-hour designation remains in effect until modified. Part 231-13 (proposed) retains the nonattainment thresholds for the severe designation under the former 1-hour standard. Although re-designated a moderate nonattainment area, in NYC, emissions of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) are subject to NNSR due to their role as precursors to the photochemical formation of ozone if the 25-tpy potential emission thresholds for either pollutant are exceeded.

If subject to NNSR, the applicant must secure certifiable emission reduction credits from within the ozone nonattainment area (or another nonattainment area if NO_x and VOC emissions from the area contribute to the NAAQS violation in the nonattainment area) in an amount sufficient to offset the increased emissions of the affected pollutant at a ratio of 1.3 to 1.

Carbon Monoxide Re-designation

On November 23, 1999, the NYSDEC submitted a request to USEPA to re-designate the New York portion of the New York--Northern New Jersey--Long Island CO nonattainment area from nonattainment to attainment of the NAAQS for CO. USEPA approved the NYSDEC's request for the re-designation for the New York portion of the New York--Northern New Jersey--Long Island CO nonattainment area to attainment of the NAAQS for CO. This re-designation means that the threshold of regulatory concern for CO rises from 50 tpy to the PSD significance threshold of 100 tpy. Offsets are no longer a condition of approval. This re-designation to attainment for CO occurred on May 20, 2002.

Proposed PM_{10} Re-designation

New York County (Manhattan) is currently designated as a moderate nonattainment area for PM_{10}. NYSDEC initiated the re-designation process to change Manhattan to attainment several years ago and the outcome is still uncertain. For this study, the PM_{10} nonattainment designation for Manhattan will be maintained and the boundary of this nonattainment area extends to the bulkhead line in Brooklyn.

Respirable Fine Particulate Matter ($PM_{2.5}$)

Fine particulate matter having an aerodynamic diameter of less than or equal to 2.5 microns ($PM_{2.5}$) is the subject of ongoing regulatory development. The USEPA has promulgated new $PM_{2.5}$ ambient air quality standards to address health affects and visibility degradation associated with these fine particles; however, the regulatory structure for addressing $PM_{2.5}$ impacts has not been fully implemented. New NAAQS for $PM_{2.5}$ were promulgated in July 1997 in response to research that demonstrated adverse health effects from $PM_{2.5}$ at concentrations that were well below the existing PM_{10} standards. Nonattainment areas were designated in 2005. The new $PM_{2.5}$ NAAQS are 15 micrograms per cubic meter ($\mu g/m^3$) for the annual averaging period and 35 $\mu g/m^3$ for a 24-hour averaging period. Compliance with the annual standard will be based on the 3-year average of annual arithmetic mean concentrations. Compliance with the 24-hour standard will be based on the 3-year average of the 98^{th} percentile of 24-hour $PM_{2.5}$ concentrations measured in each year.

A map of the New York, Northern New Jersey, Long Island, Connecticut $PM_{2.5}$ nonattainment area is displayed on Figure 7-6. The HA Station in Brooklyn is within this nonattainment area. The USEPA has acknowledged that the strategy for obtaining $PM_{2.5}$ attainment involves the reduction of direct $PM_{2.5}$ emissions and the precursor emissions of SO_2 and NO_x which transform in the atmosphere from gases to particulates. USEPA will be issuing guidance in the September 2007 timeframe that will establish $PM_{2.5}$ offset factors for precursor SO_2 and NO_x emissions; the direct $PM_{2.5}$ emission offsets have been established at a 1:1 ratio. Reductions in SO_2 and NO_x emissions achieved when LP Boilers cease operation not used to satisfy netting may be used to provide $PM_{2.5}$ offsets.

Conformity

For nonattainment pollutants, a conformity analysis may be required under Section 176(c) of the Clean Air Act to demonstrate consistency with the SIP for the attainment of air quality standards. The proposed Project site is designated as moderate nonattainment for ozone. The applicable thresholds for NO_x and VOC, which are ozone precursors, are 100 tpy and 50 tpy, respectively, and the $PM_{2.5}$ threshold is 10 tpy. Indirect NO_x and VOC emissions attributed to the Project construction and operation that are not included in a PSD or NNSR analysis are included in a conformity analysis (e.g. construction related activities) if the thresholds are exceeded and these emissions are not accounted for in the SIP. General conformity compliance must be demonstrated for Projects that require a federal/agency approval.

Table 7-3

Summary of National Ambient Air Quality Standards (NAAQS) and New York State Standards[(1)]

Pollutant	Averaging Time	NAAQS (µg/m^3) Primary	NAAQS (µg/m^3) Secondary	New York Standards (µg/m^3)
Carbon monoxide	8-hour 1-hour	10,000 40,000	(same as primary)	10,000 40,000
Lead	Calendar quarter	1.5	1.5	-
Nitrogen dioxide	Annual	100	(same as primary)	100
Ozone	8-hour 1-hour	157 Revoked	(same as primary Revoked	Refer to Note 2 160[(2)]
PM_{10}	Annual 24-hour	Revoked 150	 None	75[(3)] 250[(3)]
$PM_{2.5}$	Annual 24-hour	15 35	(same as primary) None	None
Sulfur dioxide	Annual 24-hours 3-hours	80 365 None	None None 1300	80 365[(4)] 1300[(5)]
Nonmethane hydrocarbons	3-hour period from 6 AM – 9 AM	None	None	0.24 ppm
Gaseous fluorides (as F)	12-hour 24-hour 1-week 1-month	None None None None	None None None None	3.7 2.85 1.65 0.8
Beryllium	1-month	None	None	0.01
Hydrogen sulfide	1-hour	None	None	14

Notes:

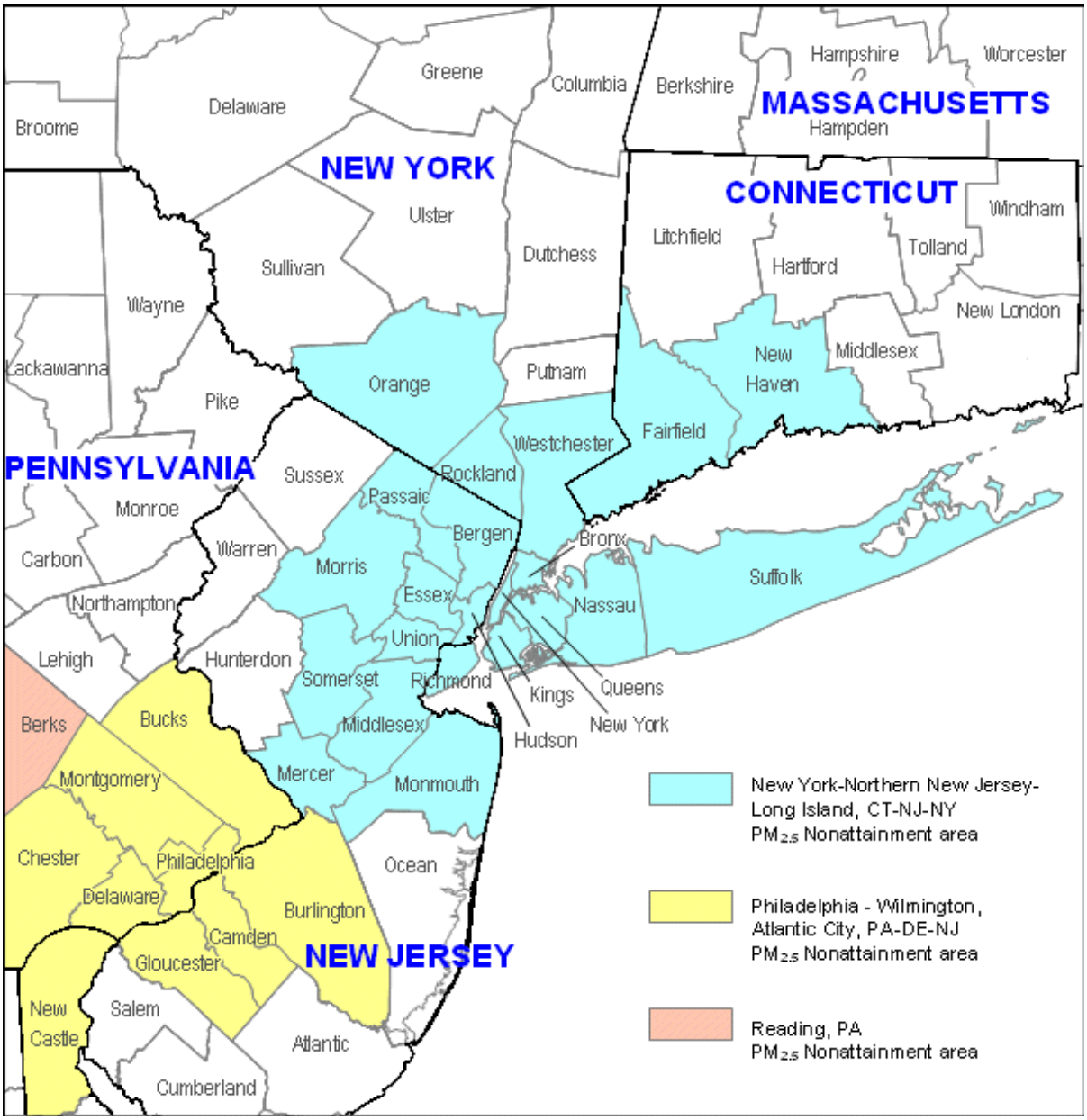
(1) All short-term (24-hours or less) values are not to be exceeded more than once per year except for PM_{10} and O_3 which are not to be exceeded more than an average of one day per year over three years. All long-term values are not to be exceeded except for PM_{10} which is not to be exceeded by the arithmetic average of the annual arithmetic averages from 3 successive years. Fluorides, beryllium and hydrogen sulfide values are not to be exceeded.

(2) Current standard (160 micrograms per cubic meter [µg/m^3]) is being revised to match federal standard.

(3) Per 6 NYCRR Subpart 257-3. Annual PM_{10} standard is for Level IV area (densely populated).

(4) During any 12 consecutive months, 99% of the values shall not exceed 262 µg/m^3. This additional restriction does not apply to predicting future concentrations.

(5) Same as (3) except value shall not exceed 655 µg/m^3.



	Consolidated Edison Company of New York, Inc. July 2007	**New York, Northern New Jersey, Long Island, Connecticut $PM_{2.5}$ Nonattainment Area**	Figure 7-6 www.ensr.aecom.com

7.4.3 New York State Implementation Plan Requirements

In regulations promulgated as part of the New York SIP, NYSDEC has promulgated emission standards and fuel use restrictions. These emission standards and restrictions are covered under Subpart 225-1.2 (fuel sulfur content) and Part 227 (Stationary Combustion Installations). The applicable requirements are summarized below.

7.4.4 Sulfur Dioxide

Subpart 225-1.2 limits the maximum fuel sulfur content in NYC to 0.3 percent and 0.2 percent by weight for No. 6 and No. 2 oils, respectively. The existing LP Boilers use No. 6 oil with a 0.3% S content. In addition to the fuel sulfur limits, NYSDEC promulgated a cap-and-trade program under Part 238, the Acid Deposition Reduction (ADR) SO_2 Budget Trading Program, which was designed to reduce acid deposition in NYS by limiting SO_2 emissions from stationary sources defined as SO_2 budget units. This program was initiated to reduce both acid deposition and secondary $PM_{2.5}$ formation. This regulation applies to SO_2 budget units, which are units determined by the administrator to be "affected units" as defined in the Acid Rain provisions at 42 U.S.C. section 7651a(2). Boiler 100 will likely be subject to Part 238 due to the electrical output.

7.4.5 Particulate Matter and Opacity

Part 227 sets particulate matter limitations on stationary combustion installations. Under 6 NYCRR Subpart 227-1.2, the particulate emission limit for a stationary combustion installation that fires oil, and has a maximum heat input greater than 250 MMBtu/hr, is 0.10 lb/MMBtu (based on USEPA Method 5 sampling). The NNSR LAER requirement may result in a more stringent emission limitation.
Part 227 sets limitations on the opacity of emissions for stationary combustion installations. Under 6 NYCRR Section 227-1.3: average opacity greater than 20 percent for a 6-minute block period in any continuous 60 minute period; one 6-minute average per hour of up to 27 percent opacity may be excluded.

7.4.6 Nitrogen Oxides

Emission Limitations (6 NYCRR Part 227-2)

NO_x emissions must be monitored with a continuous emission monitoring system (CEMS) that complies with the requirements of Part 227-2.6.

NOx Budget Rule (Subpart 227-3)

In recognition of ground-level ozone concentrations that were above the NAAQS throughout the Northeast, and the necessity to approach air pollution from a regional perspective, Congress created the Ozone Transport Commission (OTC) in the Clean Air Act Amendments of 1990. USEPA assessment of the ozone problem in the Northeast indicated that reductions in NO_x emissions beyond that which would be achieved through the implementation of Reasonably Available Control Technology (RACT) were necessary to achieve attainment of the ozone NAAQS throughout the ozone transport region (OTR). On September 27, 1994, the OTC signed a Memorandum of Understanding (MOU) with the States in the OTR wherein the States agreed to propose regulations to significantly reduce NO_x emissions from existing utility and large boiler sources across the OTR.

On January 12, 1999, the New York Environmental Board unanimously approved the Pre-2003 Nitrogen Oxides Emissions Budget and Allocation Program (6 NYCRR Subpart 227-3) as well as amendments to 227-2, 227-1, and 200. This program was promulgated to fulfill New York State's commitment to implement the "Phase 2" NO_x emissions reductions as outlined in the MOU. Under

this program, "budget" sources must hold a quantity of NO_x allowances during the allocation period (calendar years 1999 through 2002) equal to or greater than the NO_x emissions emitted by the source during the peak ozone season (May 1 through September 30). An allowance is an authorization to emit one ton of NO_x. The regulations require subject sources to continuously monitor and report NO_x emissions for each affected unit.

NO_x Trading Program (6 NYCRR Part 204)

On January 26, 2000 the New York Environmental Board approved 6 NYCRR Part 204, the NO_x Budget Trading Program, as required by the USEPA's October 27, 1998 Ozone Transport SIP Call. Under Part 204, NOx allowances have been set aside for new projects in the new unit sector set-aside allocation pool pursuant to Section 204-5.3(e).

Under the NO_x Budget Trading Program (6 NYCRR Part 204), NO_x allowances are allocated to NO_x Budget units, including the HA Station, by April 1 of each year for the control period (ozone season) three years later (2006 allowances were allocated by April 1, 2003). Allocations are based on the greatest ozone season heat input from any single ozone season among the three seasons proceeding the date by which the Department must submit allocations (2006 allocations are based on 2000-2002 ozone season heat inputs).

New emission sources will need to secure NO_x allowances annually for the projected emissions during the ozone season. New emission sources will not get the same allowances as the replaced source. Allocations for the new source will come from a set-aside pool. The set-aside pool is a pseudo-first-come-first serve allocation methodology. If the NYSDEC receives requests for more allowances than are available, they are prioritized per calendar quarter. Requests will be considered simultaneously if they are from the same calendar quarter, and NO_x allowances will be reserved proportionally to the number of allowances requested by each unit. Banked allowances are also available for purchase/transfer by new projects.

A unit that is shut down and surrenders its permit will cease to receive allocations. A unit that is shut down but does not turn in its permit will continue to get allocations; however, allocations for future years are based on actual ozone season operation. In accordance with the allocation methodology, the allocations will decrease to zero after 6 years. However, since the existing boilers will be removed from the operating permit as part of the netting/Emission Reduction Credits (ERC) transfer (offsets) upon the operation of Option 3A equipment, the NO_x allowance allocations will cease for the retired unit, and there will likely be no transfer of NO_x allowances.

ADR NOx Budget Trading Program (6 NYCRR Part 237)

In addition to Subpart 227-3 and Part 204, NYSDEC promulgated the ADR NO_x Budget Trading Program as a cap-and-trade program during the non-ozone season to reduce acid deposition and secondary formation of $PM_{2.5}$ in New York State by limiting emissions of NO_x from fossil fuel-fired electricity generating units. With limited exemptions, any unit that serves a generator with a nameplate capacity equal to or greater than 25 MW shall be a NO_x budget unit if it sells any amount of electricity, and a NO_x budget source is defined as any source that includes one or more NO_x budget units.

7.4.7 New Source Performance Standards

The USEPA has promulgated new source performance standards (NSPS) for new and modified existing sources of air pollution; these standards are codified under 40 CFR Part 60. Pollutant-specific standards have been set or proposed for various boilers depending on size, whether electricity is produced and fuel used. NYSDEC implements the federal NSPS program and has authority to manage the review process under this program.

New Boilers

The two new package boilers solely producing steam will have a maximum heat input of ***[REDACTED]*** MMBtu/hr each, which is greater than the 250-MMBtu/hr applicability threshold of NSPS Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*. A "steam generating unit" is defined as "a device that combusts any fuel or byproduct/waste to produce steam or to heat water or any other heat transfer medium." The new boilers are by definition not "electric utility steam-generating units" because they do not supply more than one-third of potential electric output and more than 25 MW net electrical output to a utility power distribution system for sale; therefore, NSPS Subpart Da is not applicable to these boilers.

Subpart Db limits emissions of SO_2, particulate matter (PM), and NO_x for boilers with various fuels, and also limits opacity.

The proposed boilers, which will fire natural gas and fuel oil with less than 0.3% sulfur by weight, are exempt by this restriction from all other SO_2 emission limits in Subpart Db per 40 CFR 60.42b(k)(2). LSD has a sulfur content of 0.047% S and ULSD has a sulfur content of 0.0015% S by weight.

Prior to the February 27, 2006 and June 13, 2007 amendments, particulate matter emissions from oil- and gas-fired boilers were limited to 0.10 lb/MMBtu per 40 CFR 60.43b(b), and 40 CFR 60.43b(f) limited opacity to 20 percent as a six-minute average, except for one six-minute period per hour during which opacity is limited to 27 percent. The June 13, 2007 amendments modified this requirement such that units commencing construction after February 28, 2005 combusting only low sulfur oil (less than 0.3 percent by weight) or other liquid or gaseous fuels with a potential SO_2 emission rate of 0.32 lb/MMBtu or less are not subject to the PM or opacity limits in Subpart Db (per 40 CFR 60.43b (h) (5). The February 9, 2007 proposed amendment includes an exemption from continuous opacity monitoring of steam generating units that do not use post-combustion technology to reduce SO_2 or PM emissions and that burn only liquid (excluding residual oil) or gaseous fuels with potential SO_2 emission rates of 0.06 lb/MMBtu or less.

NO_x emissions (expressed as NO_2) from boilers firing natural gas and distillate oil are limited to either 0.10 lb/MMBtu for steam generating units with a low heat rate (less than or equal to 70,000 Btu/hr per cubic foot of furnace volume) or 0.20 lb/MMBtu for units with a high heat rate (greater than 70,000 Btu/hr-ft^3) per 40 CFR 60.44b (l). The February 27, 2006 amendment allows units to comply with an optional limit of 2.1 lb/MWh gross energy output.

The new package boilers will not be subject to the limitations for SO_2 and PM because they will fire only natural gas and LSD or ULSD. Compliance with Subpart Db will be demonstrated by maintaining certifications of the fuels burned. Per the proposed amendment, Subpart Db will not require PM compliance tests, continuous monitoring, or other recordkeeping. Compliance with the NO_x limit will be achieved through the use of LNB and SCR, and a continuous emissions monitor will be used to demonstrate NO_x compliance.

Boiler 100 Upgrade

Boiler 100 is not currently subject to NSPS, but the proposed changes may subject it to the provisions of either Subpart Da or Subpart Db as a modification, a reconstruction or a new source. For NSPS purposes (per 40 CFR 60.14), a modification essentially occurs when any physical or operational change to an existing facility results in an increased emission rate (expressed as kg/hr) of any pollutant to which a standards applies. For NSPS purposes (per 40 CFR 60.15), a reconstruction occurs when components of an existing facility are replaced to the extent that the "fixed capital costs of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility". The NYSDEC and/or USEPA will likely consider the

modified Boiler 100 as construction of a new source since it has been out of operation for several years.

NSPS Subpart Da is applicable to electric utility steam-generating units for which construction, modification, or reconstruction is commenced after September 18, 1978. An electric utility steam-generating unit is defined in 40 CFR 60.41Da as follows.

> *Electric utility steam-generating unit* means any steam electric generating unit that is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 MW net-electrical output to any utility power distribution system for sale. Also, any steam supplied to a steam distribution system for the purpose of providing steam to a steam-electric generator that would produce electrical energy for sale is considered in determining the electrical energy output capacity of the affected facility.

The upgraded Boiler 100 will have the capability to produce up to 62 MWh electricity simultaneously with steam sendout. However, it may be a matter of interpretation whether or not Boiler 100 is "constructed for the purpose of supplying more than one-third of its potential electric output and more than 25 MW net-electrical output" to the power distribution system for sale. The definition does not indicate whether or not 25 MW is a peak or annual average threshold.

7.4.8 Nonattainment New Source Review

Applicability

The HA Station is located in an area designated moderate ozone nonattainment and $PM_{2.5}$ nonattainment. New Source Review in nonattainment areas is governed by 6 NYCRR Part 231-2 (and proposed Part 231-3 through 13). NNSR requires the following:

- LAER will be met for any emission unit which is part of the facility and which emits the effected pollutant;
- The applicant must certify that any other sources in NYS under its ownership or control (or under the ownership or control of any entity which controls, is controlled by, or has

common control with the applicant) are in compliance with the Clean Air Act and NYSDEC's regulations. See 6 NYCRR § 231-2.4(a)(2)(i); 42 USC § 7503 (a)(1)(B)(3); and

- Based upon an analysis of "alternative sites, sizes, production processes, and environmental control techniques," the applicant must demonstrate "that benefits of the . . . proposed major facility significantly outweigh the environmental and social costs imposed as a result of its location [or] construction . . . within New York State." 6 NYCRR § 231-2.4 (a) (2) (ii); 42 USC § 7503 (a) (1) (B) (5).

Requirements

Lowest Achievable Emission Rate

Subdivision 231-5-2 requires that the LAER be applied to control emissions of any *nonattainment contaminant* subject to NNSR. Any internal offsets of VOC or NO_x may be used to "net out" of NNSR (applicable in areas currently or formerly designated as severe nonattainment for ozone).

Emission Offsets

According to proposed Section 231-5.5, Con Edison must obtain emission reduction credits (ERCs) to offset the emission potential by the amounts provided in Section 231-5.5 if the significant project thresholds are triggered. Section 231-13.3 Table 3 contains the specified offset ratio for ozone nonattainment areas (1.15:1 for NO_x and VOC precursor emissions) and Section 231-13.4 Table 4 specifies 1:1 for PM_{10} and $PM_{2.5}$ offset ratios. PM_{10} ERCs are not required for the HA Station, since Kings County is attainment for PM_{10}.

Con Edison will need to obtain the necessary ERCs to offset the emissions from the new boilers from the following sources if the 25-tpy threshold is exceeded for NO_x and / or VOC emissions or if the 10 tpy threshold for $PM_{2.5}$ is exceeded after netting with representative historical emissions for the LP Boilers:

- Obtain ERCs for partial emissions not used in nettings and confirm that no ERCs are available from Boiler 100 shutdown in 2004.
- Obtain ERCs registered with the NYSDEC from other sources; and
- Create ERCs through reducing VOC / NOx and / or PM2.5 emissions at other sources.

Demonstration of Compliance

Con Edison must certify that all emissions sources that are part of any major facility located in New York State and are under the Applicant's ownership or control are in compliance, or are on a schedule for compliance, with all applicable emission limitations and standards under the Clean Air Act.

Environmental and Social Benefits Analysis

In accordance with 6 NYCRR Section 231-2.4(a), the Applicant must include an analysis of alternative sites, sizes, production processes, and environmental control techniques demonstrating that benefits of the proposed *source project* significantly outweigh the environmental and social costs imposed as a result of its construction within New York State.

Net Air Quality Benefit Analysis

The Application must include an air quality impact evaluation, in accordance with Section 231-5.5 (d), demonstrating for $PM_{2.5}$ that: (1) the net impact of the proposed emissions increase and the *emission offset* provides for a net benefit, on balance, in the area affected by the proposed *source project*, and (2) that the net impact in no case exceeds an applicable significant impact level. Note that although the proposed Subpart 231-5 includes text from existing Section 231-2.4 that requires a net benefit analysis specifically for PM_{10}, NYSDEC DAR-10 dated May 9, 2006 states "for $PM_{2.5}$, EPA is in the process of formulating similar levels which can be used when adopted".

Applicability to Option 3A – New Boilers

REDACTED

7.4.9 Prevention of Significant Deterioration (PSD) Review

General Applicability

The existing LP Boilers are defined as a major stationary source because fossil-fueled boilers totaling more than 250 MMBtu/hr in combination are one of the 28 major source types listed in 40 CFR Part 52.21(b)(1) and each station has the potential to emit more than 100 tpy of a PSD-regulated pollutant (e.g., SO_2, NO_x). Pursuant to 40 CFR Part 52.21, Option 3A will be subject to PSD review for each attainment criteria pollutant for which the potential increase in emissions associated with the new / upgraded boilers and the resultant net emissions increase (accounting for the historical operation of the LP Boilers), are equal to or greater than the respective pollutant's significant emission rate set by USEPA (proposed NYSDEC Part 231 -13.6 Table 6). Conversely, individual pollutants can be eliminated from PSD review by demonstrating that potential emissions from the new equipment alone, or resulting net emissions increases, are less than the significant emission rates.

The USEPA has established significant net emission increase thresholds for CO, NO_x, SO_2, PM_{10}, $PM_{2.5}$, VOC (as a precursor of ozone), Pb, fluorides, H_2SO_4, and reduced sulfur (see Table 7-4). Of these, $PM_{2.5}$ and VOC are nonattainment pollutants in Kings County; therefore, these compounds are not subject to PSD review. (NO_x is both a nonattainment and an attainment pollutant.) For natural gas firing, fluoride emissions and reduced sulfur emissions (as well as emissions of other compounds regulated under the Clean Air Act) are negligible and will not be considered further. Therefore, the PSD applicability analysis considers only SO_2, NO_x, CO, H_2SO_4, PM_{10} and Pb in Kings County (HA Station location).

PSD regulations require that an owner or operator of a major new source perform the following analyses for those pollutants subject to PSD review:

- Analysis of existing air quality in the vicinity of the source;
- Application of BACT to the proposed source;
- Assessment of air quality impacts resulting from pollutant emissions from the source;

- PSD increment consumption, visibility, and air quality related values (AQRVs) impact analyses at PSD Class I areas (generally within 100 kilometers [km]);
- Assessment of the effects of emitted pollutants on soils, vegetation in the source's impact areas; and
- Assessment of impacts associated with indirect economic growth.

The components of a PSD permit application dealing with ambient air quality impacts are discussed below.

Table 7-4

PSD and Nonattainment Emission Thresholds for a New Project at an Existing Major Source

Prevention of Significant Deterioration (Attainment Pollutants)

Regulated Pollutant	PSD Significant Emission Threshold (tpy)
Carbon monoxide (CO)	100
Nitrogen oxides (NO_x)	40
Sulfur dioxide (SO_2)	40
Respirable particulate matter (PM_{10})	15
Ozone (O_3) (as Volatile Organic Compounds, VOC)	40
Lead (elemental) (Pb)	0.6
Total Fluorides (F)	3
Sulfuric acid mist (H_2SO_4)	7
Total reduced sulfur compounds (TRS)	10
Any other pollutant regulated under the Clean Air Act (e.g., CFCs 11, 12, 112, 114, 115 and Halons 1211, 1301, 2402)	Any Emission Rate

Nonattainment New Source Review (Nonattainment Pollutants)

Regulated Pollutant	Non-Attainment Significant Emission Threshold (tpy)
Nitrogen oxides (NO_x)	25
Volatile Organic Compounds (VOC)	25
Respirable particulate matter (PM_{10})	15
Fine particulate matter ($PM_{2.5}$)	10

Notes:
tpy = tons per year
CFC = chlorinated fluorocarbon
Source: 40 CFR 52.21(b)(23) and 1990 Clean Air Act Amendments Section 112(b)(6)

Analysis of Existing Ambient Air Quality

Generally, an application for a PSD permit must contain an analysis of ambient air quality in the vicinity of the proposed source for each pollutant subject to PSD review. Air quality data are obtained from a pre-construction monitoring program or, under certain conditions, from existing monitoring data. Existing air quality may be used in lieu of pre-constructing monitoring if:

- The data are representative of the proposed facility's impact areas;
- The data are of similar quality as would be obtained if the Applicant monitored according to the PSD requirements; and
- The data are current; that is, the data have been collected during the two-year period preceding the permit application, provided the data are still representative of current conditions.

USEPA will likely waive the PSD program's ambient air quality monitoring since the net emissions of pollutants subject to PSD review (likely only PM_{10}) will cause ambient impacts below the defined de minimis monitoring concentrations established by the USEPA (40 CFR 52.21(i)(8); see Table 7-5).

Best Available Control Technology

The basic control technology requirement for a major stationary source subject to PSD review is the application of BACT, which is defined by the USEPA as follows:

> An emission limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant..… (40 CFR 52.21(b) (12).

A new major stationary source must apply BACT for all regulated pollutants subject to PSD review.

Air Quality Impact Analyses

The PSD regulations limit the amount that air quality concentrations can be increased above existing ambient levels. These allowable increases in concentrations (PSD increments) have so far only been established for SO_2, PM_{10}, and NO_2 (40 CFR 52.21 (c)). The PSD increments are a function of area categorization as shown in Table 7-6 (note that Class III is omitted since there are no defined Class III areas):

- Class I. Areas where almost any deterioration of air quality is undesirable and little or no major industrial development is allowed.
- Class II. Areas where moderate, well-controlled energy or industrial growth is desired while complying with NAAQS.

The closest Class I area is the Edwin B. Forsythe National Wildlife Refuge, located in southeastern New Jersey (just north of Atlantic City) approximately 150 km to the south of the HA Station. The rest of the area surrounding the HA Station is classified as a Class II area.

The USEPA has defined a set of impact levels used to determine whether a major new source or modification will "significantly" affect a PSD Class II area (40 CFR §51.165(b)(2)). These significant

impact levels (SILs), shown in Table 7-7, are interpreted by the USEPA and the NYSDEC as representing the minimum amount of ambient impact below which no further analysis of major new source impacts is required. SILs have also been developed for PSD Class I areas. The primary purpose of comparing modeled concentrations with the SILs is to establish a source's significant impact area for each pollutant. Major background sources located in the proposed source's pollutant-specific significant impact area (SIA), as well as other sources which could significantly interact within the proposed source's SIA, are generally modeled as part of the air quality impact analysis. Therefore, with respect to PSD, the SILs are merely a regulatory tool to determine the level of air dispersion modeling required in order to demonstrate compliance with applicable air quality standards.

In accordance with USEPA modeling guidance (USEPA, 1990), a NAAQS compliance analysis under the PSD program is conducted only for those pollutants subject to PSD review. Once compliance with the NAAQS has been determined, compliance with the PSD increments must be demonstrated.

Former NYSDEC policy set forth in Air Guide-26 limited the amount of the available PSD increment that can be consumed by a proposed project to 75 percent and 25 percent of the short-term and annual available increments. The policy allows the NYSDEC to approve a higher percentage at its discretion. The implementation of PSD is no longer delegated to NYSDEC as of March 3, 2003, but NYSDEC's proposed Part 231 revisions include PSD provisions and limitations on increment consumption.

Additional Impact Analyses

The PSD program requires that air quality impacts resulting from growth in the area of the project be assessed. Types of growth include the associated industrial, commercial, and residential growth that will occur as a result of the facility. In addition, the program requires that impacts on soils and vegetation be assessed. Furthermore, an assessment of potential visibility impairment must be conducted. Based on precedent for the East River Repowering Project established by NYSDEC, a screening visibility analysis may be needed for Harriman and High Tor State Parks.

PSD Class I Analysis

Class I areas are areas of special national or regional value from a natural, scenic, recreational, or historical perspective. The PSD program provides special protection for such areas. Sources located generally within 100 km of a Class I area must demonstrate that the PSD Class I increments will not be exceeded, nor will certain air quality-related values (including visibility) be adversely affected. As indicated previously, the closest PSD Class I area, Edwin B. Forsythe National Wildlife Refuge to the north of Atlantic City, NJ, is located greater than 100 km south of NYC. Therefore, a PSD Class I analysis will likely not be required with the exception that a screening level visibility analysis may be requested by NYSDEC or USEPA.

Applicability to Option 3A – Upgrade Boiler 100/ New Boilers

REDACTED

Table 7-5

PSD De Minimis Monitoring Concentrations[3]

Pollutant	Concentration ($\mu g/m^3$)	Averaging Period
Carbon monoxide (CO)	575	8-hour
Nitrogen dioxide (NO_2)	14	Annual
Sulfur dioxide (SO_2)	13	24-hour
Respirable particulate matter (PM_{10})	10	24-hour
Fine particulate matter ($PM_{2.5}$)	[4]	[4]
Ozone (O_3)	[1]	
Lead (Pb)	0.1	3-month
Sulfuric acid mist (H_2SO_4)	[2]	
Total fluorides (F)	0.25	24-hour
Total reduced sulfur (TRS)	10	1-hour

Notes:

(1) All cases where emissions of VOC are less than 100 tons per year.

(2) No satisfactory monitoring technique available at this time.

(3) If the predicted ambient impact, i.e., the highest modeled concentration for the applicable averaging time, caused by the proposed significant emissions increase (or significant net emissions increase) are less than the prescribed significant monitoring value, the permitting agency has discretionary authority to exempt an applicant from this data requirement.

(4) Not yet established by USEPA (will likely be proposed September 2007)

Source: 40 CFR 52.21(i)(8)(i)

Table 7-6

Federal PSD Increments ($\mu g/m^3$)

Pollutant	Averaging Period	Class I	Class II *
SO_2	3-hour	24	512
	24-hour	5	91
	Annual	2	20
NO_2	Annual	2.5	25
PM_{10}	24-hour	8	30
	Annual	4	17
$PM_{2.5}$ **	24-hour	--	--
	Annual	--	--

Notes:

All 3- and 24-hour increments can be exceeded once per year.

Initial classification of PSD areas follow the scheme given below:

Mandatory Class I:

- International parks
- National wilderness areas (more than 5,000 acres)
- National memorial parks (more than 5,000 acres)
- Existing national parks (more than 6,000 acres)
- Other currently designated Class I areas

Remainder of the country is Class II unless area is in noncompliance with NAAQS.

Source: 40 CFR 52.21(c)

* The area surrounding the HA Station is either classified as Class II for attainment pollutants [SO_2, NO_2, PM_{10}, (Brooklyn)] or non-attainment for other pollutants [e.g., VOC, NOx, PM_{10}, and $PM_{2.5}$ (Manhattan)].

** $PM_{2.5}$ PSD increments have not been established

Table 7-7

Significant Impact Levels (μg/m^3) for Dispersion Modeling

Pollutant	1-hour	3-hour	8-hour	24-hour	Annual
SO_2	-	25	-	5	1
PM_{10}	-	-	-	5	1
$PM_{2.5}$ *	-	-	-	2	0.3
NO_2	-	-	-	-	1
CO	2,000	-	500	-	-

Source: 40 CFR 51.165(b)(2)

* No SILs yet established by USEPA, 24-hour $PM_{2.5}$ SIL proposed by the Clean Air Association of the Northeast States (NESCAUM) and contained in recent New Jersey DEP $PM_{2.5}$ guidance.

7.4.10 New York State Permit Requirements

Title V Operating Permit

In accordance with Title V of the 1990 Clean Air Act Amendments and 40 CFR Part 70, NYS developed an operating permit program (6 NYCRR Part 201-6). Prior to promulgation of Part 201-6, facilities such as those of Con Edison were issued Certificates to Operate by the NYSDEC which allowed the facility to operate in accordance with applicable federal and State regulations. The NYSDEC has issued a Title V permit for the HA Station. The upgrade of Boiler 100 along with the installation of two new boilers, the shutdown of the LP Boilers and the switch in fuels would represent significant modifications of the Title V facility permit.

7.4.11 Clean Air Act Title III Requirements

Maximum Achievable Control Technology (MACT) (Section 112(g))

The amended 1990 Clean Air Act included at Section 112(g) a program that requires sources to implement controls to limit emissions of hazardous air pollutants (HAPs) if they build new major HAP sources before the applicable source category MACT is promulgated. Newly constructed facilities are subject to 112(g) requirements if they have the potential to emit HAPs in major amounts (10 tpy of an individual HAP or 25 tpy of a combination of HAPs).
The permit review report accompanying the HA Station's existing Title V permit states that MACT is not applicable; however, the Station is listed with major quantities of HAPs (greater than 10 tpy each of hydrogen chloride and nickel compounds). Major sources of HAPs are those with a facility-wide potential to emit more than 10 tpy of an individual HAP or more than 25 tpy of the aggregate of HAPs. Operators of industrial, commercial, or institutional boilers that are located at major sources of HAPs are subject to National Emission Standards for Hazardous Air Pollutants (NESHAPs) under 40 CFR 63 Subpart DDDDD, which applies to new, reconstructed, or existing affected sources. New and reconstructed large liquid fuel boilers must comply with the following emission limits:

- Particulate matter 0.03 lb/MMBtu
- Hydrogen chloride 0.0005 lb/MMBtu (0.0009 lb/MMBtu if limited use liquid fuel boiler)

- Carbon monoxide 400 ppmvd @ 3% O2 (30-day rolling average for units ≥ 100 MMBtu/hr)

Limited use boilers are those large units with capacity utilizations less than or equal to 10 percent. New and reconstructed large gaseous fuel boilers must comply with same CO limit stated above for liquid fuel boilers.

Risk Management Plan (Section 112(r))

Title III, Section 112(r) of the Amendments required the USEPA to promulgate regulations to prevent accidental releases of regulated substances and to reduce the severity of those releases that do occur. Pursuant to this requirement, the USEPA promulgated 40 CFR Part 68. Stationary sources with processes that contain more than a threshold quantity of a regulated substance are subject to these regulations. The Option 3A project will not be subject to these regulations because storage of a regulated substance in greater than the threshold quantity will not occur. (Aqueous ammonia is a regulated substance if it is stored as a 20 percent or greater ammonia solution.) The aqueous ammonia associated with an SCR system for NO_x control is generally limited to a solution of 19 percent. In addition, the use of urea in an ammonia-on-demand system is under consideration for the new project at HA Station. Based on previous NYSDEC decisions, if aqueous ammonia storage is selected for the new boilers, a risk analysis and management plan will likely be required to address community and agency concerns, even though 40 CFR 68 is not triggered.

Nickel HAP Regulation

Nickel (Ni) emissions arise from the firing of No. 2 and No. 6 oil. The Ni content of the fuel can vary based on the source region and the refining process. Since most oil-fired boilers are uncontrolled with respect to particulate emissions, Ni emissions originate from the existing boilers at the HA Station.

The HAP regulations promulgated under Title III of the Clean Air Act Amendments are limited to the category of "Electric Utility Steam Generating Station". Therefore, any regulations promulgated in the future to control Ni emissions will not apply to the existing boilers since they only supply steam (these boilers do not generate electricity). The fact that regulations will be promulgated for a specific category of oil fired boilers may provide an issue for additional controls/fuel changes at the existing boilers that could be advanced by intervenors. The use of a more refined oil, LSD or ULSD, will result in reduced Ni emissions since there is less ash in ULSD versus the No. 6 oil fired in the LP Boilers. Limiting the LSD or ULSD use to 720 hours will likely exempt the new boilers from this regulation.

7.4.12 Federal and New York State Acid Deposition Control Requirements

Title IV Federal Acid Rain Program

One of the major programs under the 1990 Clean Air Act Amendments concerns the control of SO_2 and NO_x, precursors of acid rain. The centerpiece of Title IV is the establishment of an emissions allowance and trading program for electric generating equipment. USEPA has promulgated several regulations (codified under 40 CFR Parts 72 through 78) to implement the acid rain provisions.

New York State Acid Deposition Requirements

Because acid rain is a major concern, the State of New York enacted the State Acid Deposition Control Act (Environmental Conservation Law [ECL] Article 19, Title 9). This regulation applies to any major stationary source that will emit acid rain precursors (NO_x and SO_2) in excess of 100 tpy. In accordance with this act, a new project's contribution to the deposition of sulfates and nitrates at sensitive receptors located in New York and nearby States must be quantified.

Since emissions of NO_x and SO_2 are projected to be less than 100 tpy each due to the use of SCR/LNB and natural gas and LSD or ULSD respectively and the limitation on annual operation may be less than 3300 hours per year, the upgrade of Boiler 100 and two new package boilers would likely be exempt from this requirement.

7.4.13 Compliance Assurance Monitoring

The provisions of 40 CFR Part 64 (Compliance Assurance Monitoring [CAM]) potentially apply to any compound emitted from the proposed emission units. For CAM to apply to a compound-specific emission unit, the following three criteria must be met:

1. The units must be subject to an emission limitation or standard for the regulated air compound or a surrogate of that compound;

2. The unit must use an active control device to achieve compliance with an emission limitation or standard; and

3. The unit must have potential pre-control device emissions in the amount of tons per year required to classify that unit as a major source under Part 70.

This provision exempts from CAM emission limitations and standards for which a 40 CFR Part 70 or Part 71 (renewable operating) permit specifies a continuous compliance determination method. Con Edison will be required to monitor NO_x emissions on a continuous basis in accordance with NSPS Subpart Db.

7.4.14 New York State Air Toxics Emissions Guidelines

Combustion of natural gas and ULSD will result in the emission of certain non-criteria compounds, including potentially toxic air compounds that are not regulated by the USEPA or the NYSDEC. These compounds include ammonia, formaldehyde and other trace products of incomplete combustion, and trace metals contained in the fuel. Aqueous ammonia will be used for SCR operation to control NOx emissions.

The NYSDEC has developed a policy (referred to as Air Guide-1) that provides guidelines for the control of toxic ambient air contaminants. Air Guide-1, which was issued in draft form in 1991 and has been updated as recently as 1995, requires an applicant to conduct an air quality impact of air toxic compounds to demonstrate that emissions of such pollutants do not result in unacceptable human exposure and health risk. The predicted short-term and annual concentrations of toxic air compounds are compared to short-term and annual guideline concentrations (SGCs and AGCs) found in Appendix C to Air Guide-1. Although the use of natural gas and ULSD will reduce the emissions of air toxics addressed in Air Guide-1, a modeling demonstration for Air Guide-1 compliance will likely be requested by the NYS Department of Health.

7.4.15 Environmental Justice

On February 11, 1994, President Clinton signed Executive Order 12898 on federal actions to address EJ - an assessment to determine if there is a disproportionately high and adverse impact on minority or low-income communities due to a proposed project. The PSD air quality regulation was a federally-delegated program in the State of New York and NYSDEC has relinquished and has again applied for delegation. As such, federal rules for environmental justice need to be addressed and included in the PSD permit application. In December 2000, the USEPA Region II developed guidance criteria for EJ investigations. These criteria were developed for minority and low-income populations in urban and rural settings anywhere in USEPA Region II.

The NYSDEC has initiated its policy on Environmental Justice and DEC Permitting. The policy became effective in April 2003. The policy enhances the NYSDEC permit review process by establishing:

- A methodology for conducting a preliminary screen to identify potential adverse environmental impacts and determine whether the impacts are likely to affect a potential environmental justice area.
- Enhanced public participation and access to information in the regulatory review process.
- In cases where NYSDEC is the lead agency, a requirement for the completion of a Full Environmental Impact Assessment Form for Unlisted Actions in potential environmental justice areas.
- A requirement for a Coordinated Review for actions in potential environmental justice areas.
- A requirement for scoping to be conducted when a potential environmental justice area is identified and an Environmental Impact Statement (EIS) is required.
- A requirement that such a scoping document and resulting EIS identify the existing environment burden and evaluate any additional burden related to the proposed action.
- A requirement to extend the public comment period for the draft EIS where a potential environmental justice area has been identified.

The policy provides guidance for incorporating EJ concerns into the NYSDEC environmental permit review process and the NYSDEC application of the SEQRA. The policy also incorporates EJ concerns into some aspects of the NYSDEC's enforcement program, grants program and public participation provisions.

The upgrade of Boiler 100 and the installation of two new boilers at the HA Station will trigger an EJ review.

7.4.16 New York City Air Pollution Control Code Requirements

Local permitting and regulatory issues are included in the SEQR processes. With respect to air quality issues, the requirements of the New York City Air Pollution Control Code (Chapter 1 of Title 24 – Environmental Protection and Utilities) are as follows:

General Prohibition on Air Pollution (§24-141)

The section of the Code prohibits the emission of air contaminants, including cadmium, beryllium, or mercury, if the air contaminant causes or may cause detriment to the health, safety, welfare, comfort of any person, or injury to plant and animal life, or causes or may cause damage to property or business.

Opacity (§24-142)

The opacity of emissions cannot obscure vision to a degree equal to or greater than smoke of number two density on the standard smoke chart. In addition, the opacity of emissions can not obscure vision to a degree equal to or greater than smoke of number one density, but less than that of a number two density, on the standard smoke chart ("Ringleman Chart") for longer than two consecutive minutes total in any 60-minute period.

Sulfur Dioxide (§24-144)

The SO_2 emissions from a boiler with a heat input capacity of 500 MMBtu/hr or more and constructed after August 20, 1971 can not exceed 100 parts per million measured at 10 percent excess air.

Particulate Emissions from Fuel Burning Equipment (§24-145)
For fuel burning equipment with a heat input capacity greater than 10 MMBtu/hr, the permissible particulate matter emission rate is provided in Figure 3 of §24-153 as

$E = 0.6575P^{0.7841}$

where E is the permissible emission rate (lb/hr) and P is the heat input rate (MMBtu/hr).

Nitrogen Oxides (§24-147)

The NO_x emissions from a boiler with a heat input capacity of 500 MMBtu/hr or more and constructed after August 20, 1971 can not exceed 100 parts per million (ppm) measured at 10 percent excess air.

Sulfur Content of Fuel (§24-169)

The sulfur in fuel limit for No. 2 oil is 0.2 percent by weight. The sulfur in fuel limit for No. 6 residual oil is 0.3 percent. The sulfur in fuel limit for LSD or ULSD proposed for Option 3A is 0.047 percent and 0.0015 percent by weight, respectively.

7.4.17 Emissions Netting

Emissions netting is a process whereby the emission increases and decreases that have occurred at an existing major source over the contemporaneous period (approximately the past five years) are totaled along with the emissions from the new unit or source modification. Netting occurs only when there will be an emissions increase that would exceed any of the pollutant-specific significant project thresholds. Emissions increases / decreases are credible for the five-year period prior to the commence construction date. Netting should only be performed if the proposed project alone will result in emission increases above the significant project levels.

Under NYS Netting Rules (proposed Subpart 231-6.2 and Subpart 231-8.2) for NNSR major modification, the following rules apply:

(a) General requirements

(1) A net emission increase determination shall be confined to the appropriate contemporaneous period for a proposed modification.

(2) A net emission increase determination will only be allowed at an existing major facility.

(3) Any creditable emission increase or ERC must be of the same class of nonattainment / attainment contaminant.

(4) Any creditable emission increase or ERC which is used in a net emission increase determination must occur at the same major facility as the proposed modification.

(5) Any creditable emission increase from an emission source issued a permit for which an emission offset or an internal offset was obtained, shall not be considered in any subsequent net emission increase determination.

(b) Permit requirements for netting. A facility owner or operator which proposes a modification which, through netting, does not result in a significant net emission increase must apply for and obtain a permit which:

(1) limits the projected actual emissions or potential to emit, as appropriate, of the modification of each applicable nonattainment contaminant(s) which exceed(s) the significant project threshold, and

(2) establishes the ERCs relied on for the net emission increase determination, if the ERCs are not already approved by the department,

(3) if ERCs currently listed in the ERC Registry maintained by the department are to be used for netting, the applicant must submit a Use of Emission Reduction Credits Form, and

(4) complies with any additional requirements of proposed Subpart 231-11.

The contemporaneous period is defined in Part 231-4 as the period beginning five years prior to the proposed commence construction date of the new or modified emission source and ending with the proposed commence operation date. The commence construction date occurs when all preconstruction permits / approvals are obtained and either actual onsite construction commences or contracts to undertake construction are executed.

ERCs are the currency of emissions netting. The rules set forth in proposed Subpart 231-10 with respect to emissions netting apply as follows:

- An ERC may be used in a net emission increase determination.
- An ERC must be the same type of regulated New Source Review (NSR) contaminant as the emission increase requiring ERCs. For example, only a particulate form of emission reduction is allowed to be used in netting for new particulate emissions.
- An ERC, or portion thereof, which was used to avoid a determination of a significant net emission increase or as an internal offset cannot subsequently be used for demonstrating attainment with ambient air quality standards or reasonable further progress in a federally approved SIP.
- An ERC, or portion thereof, which is used to avoid a determination of a significant net emission increase cannot subsequently be used for emission offset purposes or in any subsequent netting determinations.
- An ERC, or portion thereof, which was used as an internal offset cannot be used again for any purpose.
- The department will approve applications for ERCs submitted on or after the effective date of this regulation on an emission source basis. Applications submitted prior to the effective date of this regulation will be processed according to the provisions of Subpart 231-2.
- ERCs may be created from past or future emission reductions resulting from facility shutdown, emission source shutdown, curtailment, source reduction, over-control of emissions beyond an applicable limit or any other reduction mechanism acceptable to the department.

- The department may approve future emission reductions only if they are designated for a specific facility. The facility seeking to establish the future emission reductions must submit an application to the department for modification of its Part 201 permit. The permit of the facility proposing to use the future emission reductions must identify the source(s) of the reductions. The permit of the facility establishing the future emission reductions is subject to modification by the department to remove the approval of the future emission reductions if the facility proposing to use the future emission reductions does not commence construction within the time period specified in this Part, or if the applicant notifies the department of its intent to abandon the proposed new or modified facility and the applicant surrenders the permit prior to commencement of operation.

An ERC is any decrease in emissions of a regulated NSR contaminant, in tons per year, which:

- is surplus, quantifiable, permanent, enforceable, and included in a Part 201 permit; and
- results from a physical change in, or a change in the method of operation of an emission source subject to Part 201; and
  - is quantified as the difference between baseline actual emissions or baseline allowable emissions, whichever is less, and the subsequent projected actual emissions; and
  - is certified in accordance with the provisions of this Part; or
- results from a physical change in, or a change in the method of operation of an emission source not subject to Part 201, and is certified in accordance with the provisions of this Part.

The following applies to applications for ERCs at sources subject to Part 201

- Application for approval of ERCs from an emission source(s) must be for a minimum of one ton per year.
- For approval of ERCs as a result of shutdown of a facility subject to Subpart 201-5 or Subpart 201-6, the facility owner or operator must submit a written request to the department to discontinue the permit.

7.4.18 Emissions and Pollution Controls

REDACTED

$PM_{10}/PM_{2.5}$

REDACTED

REDACTED

$PM_{10}/PM_{2.5}$ emission rates vary depending upon whether or not an oxidation catalyst and / or SCR is used, the fuel sulfur content, and the methodology / data used to estimate PM_{10} emissions. $PM_{10}/PM_{2.5}$ emissions estimates include both filterable and condensable particulate matter. Minimal information on condensable $PM_{10}/PM_{2.5}$ is generally available, especially for ULSD. The oxidation catalyst will oxidize sulfur or SO_2 to sulfuric acid, which may react with ammonia potentially increasing the condensable portion of PM_{10}. LAER also requires that an emission rate be supported by an engineering analysis.

REDACTED

$\underline{NO_x}$

Add-on controls to reduce NO_x emissions will be required since the location of the HA Station is designated as a moderate ozone and $PM_{2.5}$ nonattainment area and since NO_x has been listed as a precursor emission for $PM_{2.5}$ and for ozone. These controls include LNB and SCR.

NO_x emissions from new boilers when burning natural gas should be limited to an emission rate of 5 parts per million by volume, dry basis at 3 percent oxygen (parts per million, volumetric dry [ppmvd] at 3% O_2) range. Boilers with controls have been permitted and operated in California at 5 ppmvd at 3% O_2. This emission rate can be achieved by installing ultra low NO_x burners (ULNB) with flue gas recirculation (FGR) and SCR. However, LNB with FGR and SCR is the better choice for new boilers that will also burn oil and will operate at varying loads.

LAER for oil combustion in new boilers is difficult to define due to a lack of recent permits, especially since the backup fuel may be either LSD or ULSD and there will be a 720 hour annual limit. The NO_x emission rate firing LSD or ULSD based on a vendor estimate of a NO_x removal efficiency of 70 percent with the application of LNB and SCR is approximately 0.015 pounds per million British thermal units (lb/MMBtu).

VOCs and CO

Add-on controls to reduce VOC emissions will likely be required since the location of the HA Station is designated as a moderate ozone nonattainment area.

Since an oxidation catalyst installed for the new boilers will control emissions of both CO and VOCs, these pollutants are discussed simultaneously. The oxidation catalyst may be considered Best Available Control Technology (BACT) for CO control and is considered LAER for VOC control.

REDACTED

SO_2 and H_2SO_4

BACT for SO_2 and H_2SO_4 emissions is the use of low sulfur fuels (i.e., natural gas and ULSD). The No. 6 oil currently used in the existing LP Boilers has a 0.27% S content which complies with NYC requirements. The sulfur content of ULSD will be limited to 0.0015% S. Natural gas and ULSD have comparable SO_2 emission rates and ULSD is extremely low in sulfur content when compared to other oil fuels. For example, combustion of a 0.3% S No. 6 oil increases the SO_2 emission rate by a factor of 200 when compared to the SO_2 emission rate for 0.0015% S ULSD.

Pollution Control Implementation

[REDACTED]

REDACTED

7.4.19 Netting Analysis for Option 3A

Emission estimates were developed for Option 3A and used in the emissions "netting" analysis. These estimates accounted for fuel use (natural gas and LSD or ULSD for $PM_{2.5}$), the addition of pollution controls, and the conversion of SO_2 emissions to particulate sulfate and sulfuric acid. Emission factors for the upgrade of Boiler 100 and the new boilers were obtained from vendors and experience obtained through permitting other boiler projects. A summary of the basis for emissions for Option 3A is presented in Table 7-2.

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REDACTED

Table 7-8 - Netting Results for Option 3A*

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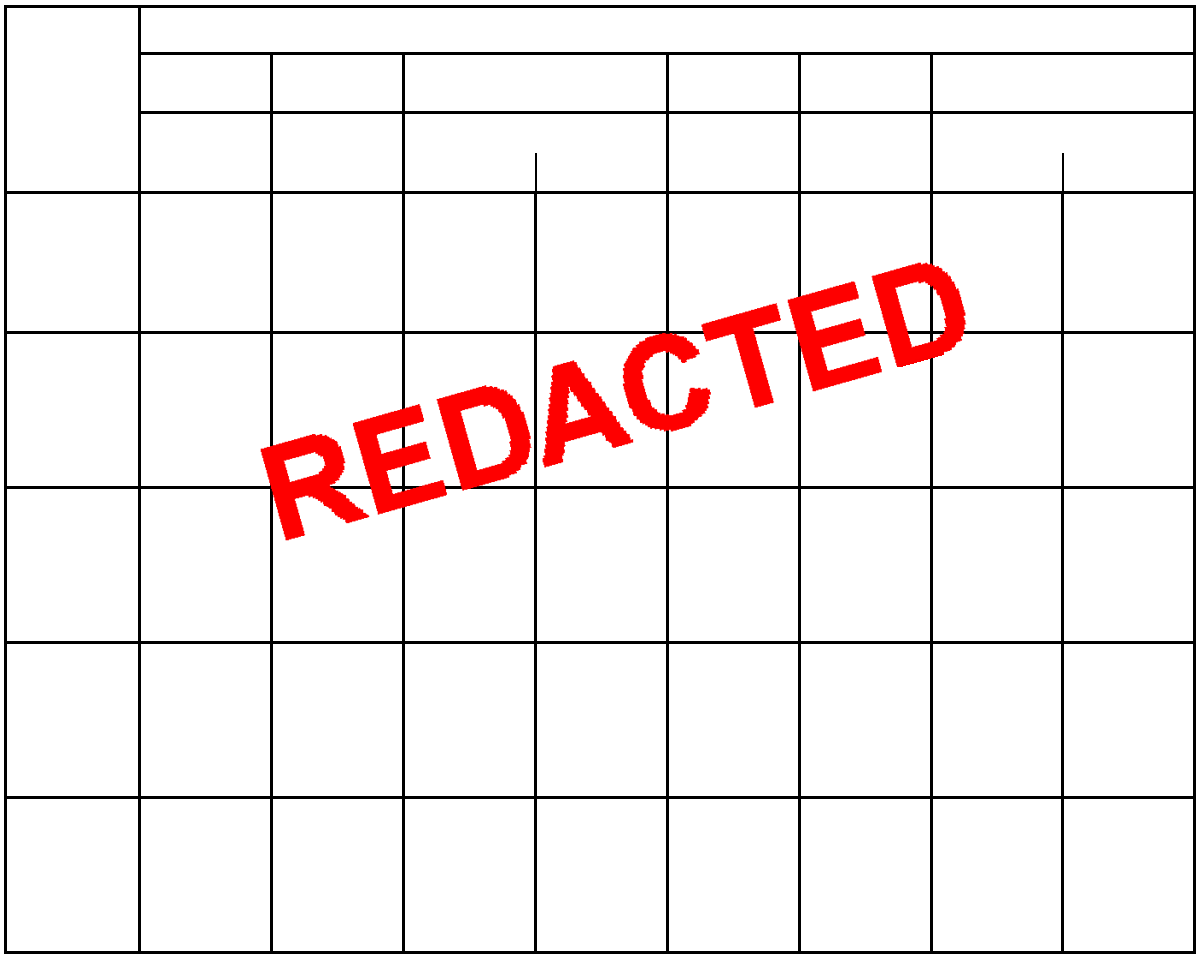
Table 7-9
Option 3A - PSD / NNSR Threshold Triggers For Netting Cases



X – Indicates threshold for PSD or NNSR review is exceeded

7.4.20 Modeling of Impacts

7.4.20.1 AERMOD Modeling Approach

Dispersion modeling was conducted using the AERMOD model, version 07026, as required by USEPA guidelines. The ground-level receptor grid and elevated receptor grids were originally developed for the dispersion modeling effort in support of the Boiler 100 reactivation in 2000. At that time, conservative estimates were made for ambient air receptor locations on buildings (elevated, "flag-pole" receptors). Additional elevated receptors for nearby residential buildings (within 2 km in Brooklyn) surrounding the HA Station were added to the modeling based on a survey conducted during a site visit in December 2006, as well as information provided by Con Edison (mid-April 2007) that was obtained through a cursory online search (mid-April 2007). During the December 2006 field visit, ambient air receptor locations (e.g., balconies, rooftop gardens) on the nearby buildings were determined both visually during the site visit and through information gleaned from the websites of the developers and owners. No field survey was conducted to determine ambient air receptors in Manhattan that are located within 2 km of the HA Station.

Modeling was conducted using a five-year meteorological data period from 1991 through 1995 (the same meteorological data for Boiler 100 dispersion modeling and the modeling approved for the East River Repowering Project). The meteorological database consists of surface data from LaGuardia Airport and upper-air data from both Atlantic City, NJ and Brookhaven, NY. Two observation locations were used for the upper air data because Atlantic City data were only available through September 2, 1994. Therefore, upper-air data from September 3, 1994 through December 31, 1995 were obtained from Brookhaven, NY. This database was approved by USEPA Region 2 and NYSDEC for the aforementioned projects.

Table 7-10 presents the AERMOD modeling parameters. New buildings in Brooklyn that were added (since December 2006) to the elevated receptor grid (as ambient air receptors) are listed in Table 7-11.

LP Boiler Representative Operation

The Option 3A project will result in the shutdown of the LP Boilers. This boiler shutdown will decrease both emissions and air quality impacts that were produced by the LP Boilers. Credit for historical emission decreases associated with 2005-2006 emissions is presented in the netting discussion (section 7.4.19). The credit for air quality impacts resulting from the emissions from the LP Boilers is more uncertain to define since the steam output from the HA Station is highly variable.

DAR-10 (May 2006) sets forth the NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis. For the HA Station, located within a nonattainment area, the $PM_{2.5}$ 24-hour and annual impacts must be addressed. Actual emission rates must be used for the offsetting source, specifically the LP Boilers. For 24-hour impacts, the maximum actual emission rate is defined as the most common (or normal) maximum operating level for an averaging time as documented by the last two years of representative operation.

[REDACTED]

NNSR Modeling Procedure

Within the NNSR requirements for sources locating in existing nonattainment areas, there are NYS requirements related to air modeling demonstrations for a significant source (emissions trigger NNSR thresholds). In accordance with DAR 10 / NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis, May 2006, NYS requires two modeling demonstrations for NNSR pollutants as follows:

- A Net Air Quality Benefits analysis that indicates the net impacts from the new source and the offsetting source. In this case the net impact is the concentration at each receptor coincident in time and space caused by emissions from the new boilers minus the emissions from the LP Boilers that will be retired.
- The net impacts at each receptor must be less than the applicable SIL over the entire grid (a SIL of 2 µg/m3 for the 24-hour PM2.5 impacts and 5 µg/m3 for the 24-hour PM10 impacts were used).

REDACTED

Table 7-10
AERMOD Modeling Parameters

REDACTED

Notes:
1. Equivalent stack diameter.
2. Calculated by reducing the filterable fraction by 12/50 and adding condensable fraction.
3. SO_2 emissions firing natural gas are insignificant.

Table 7-11

New Buildings Added to Original Hudson Avenue Boiler 100 Elevated Receptor Set*

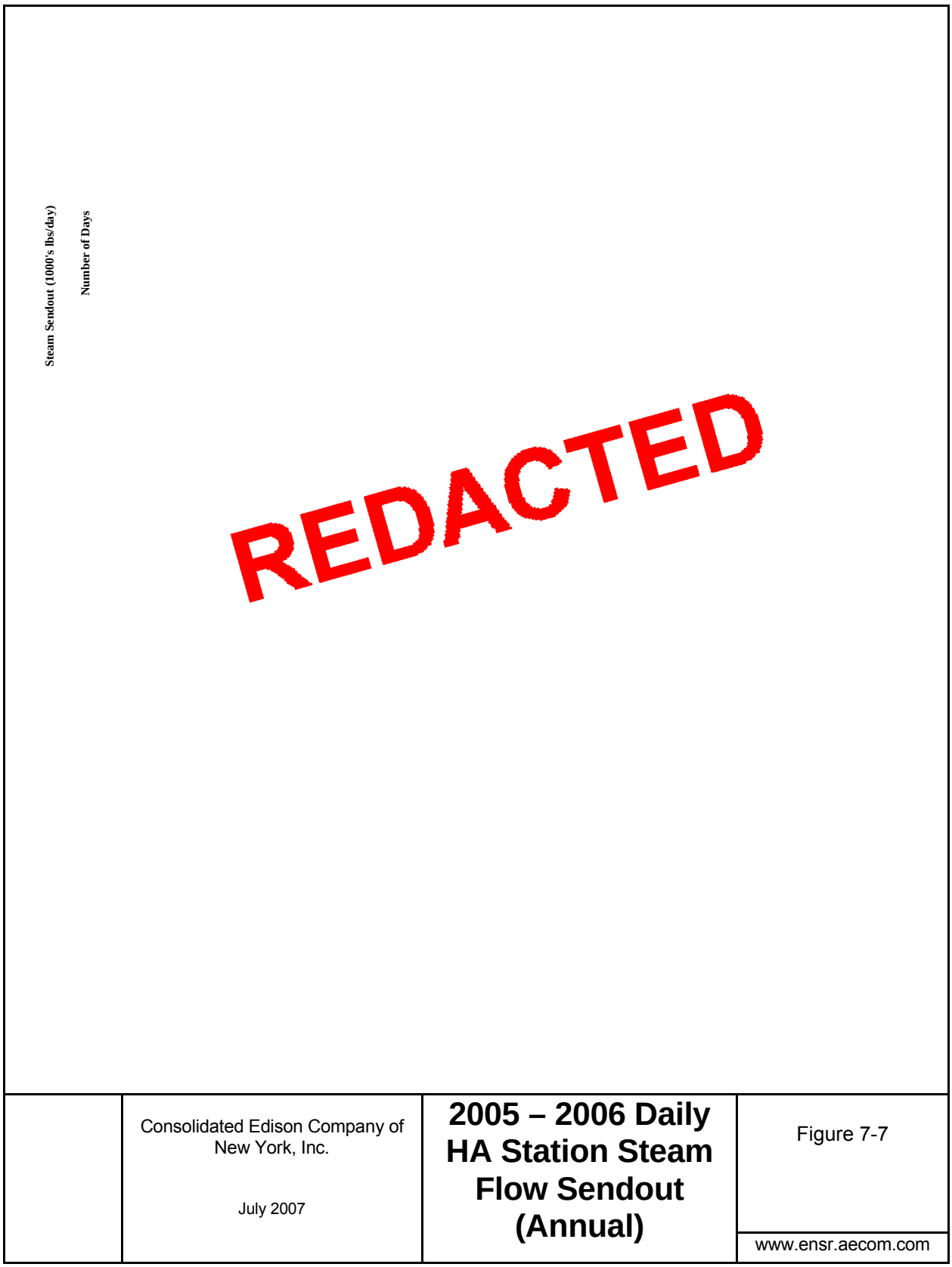
Address/Building Name	# of Stories	Height (ft)**	calculated or known?	Coordinates east	Coordinates north	Public Outdoor Access?	Comments	Source
Proposed New Residential Buildings in Vicinity of Hudson Avenue Station for inclusion in air modeling								
110 Livingston Street	16	166	calculated	585340	4504710	confirmed	Refurbish/add-on of existing building (current building is 12-stories; total of 16)	http://www.110livingston.com/html/build.html
101 Willoughby St	27	276	calculated	585800	4504820	unknown	refurbish offices to residences (previous NY Telephone Co Bldng)	various web
75 Smith St	15	156	calculated	585420	4504500	unknown	artist rendering looks like only 13 stories; may have rooftop balcony	http://www.75smith.com/; used Con Edison estimate of 15 stories to be conservative
306 Gold	40	96	calculated /known	585900	4505130	confirmed	"Johnson & Gold st" = based on source, only the 9th floor will have outdoor access (terrace). Ht is based on calculated ht to 9th story	http://www.prudentialelliman.com/Listings.aspx?ListingID=858303&rentalperiod=&SearchType=newestproperties
313 Gold	35	356	calculated	585880	4505070	unknown	"Johnson & Gold St" = second structure residences	various web
Johnson Street & Myrtle Ave	41	416	calculated	585520	4505030	unknown	found various new construction planned for this area; uncertain which building Con Edison provided info for	Con Edison
30 Ashland Place	30	306	calculated	586260	4504950	unknown	Did not find any details online	Con Edison
164 Kent Ave		400	calculated /known	587540	4507800	unknown	Found 3 structures as part of the development (29, 30, 40 stories); according to NYC Dept of Planning, max ht permitted in area is 400ft (limit due to aesthetics)	various web and Brooklyn NYC Planning office (718-643-7550)
Flatbush Ave & Tillary St		400	known	585810	4505250	unknown	This was not included on Con Ed's list; found on a June 2006 news article	http://www.therealdeal.net/issues/JUNE_2006/1149018227.php
Near Manhattan Bridge (?)	37	376	calculated	585400	4506240	unknown	This was not included on Con Ed's list; found on a June 2006 news article. Location and details are uncertain	http://www.therealdeal.net/issues/JUNE_2006/1149018227.php
Pier 6 - Brooklyn Bridge Devt Corp		315	known	584440	4505070	unknown	Tallest option listed in Project Plan as modified on Jan 18, 2006	Brooklyn Bridge Devt Corp Project Plan - http://www.empire.state.ny.us/BBPDC/

Existing Buildings (New to Former HA Boiler 100 Elevated Receptor Set)*

Bridge Street		121	calculated	585693	4506052	confirmed		
J Condo		335	calculated	585554	4505987	confirmed		
Beacon Tower		276	calculated	585464	4505930	confirmed		
Water St/Adams St		120	calculated	585363	4506106	confirmed		
unknown (Northeast of Station)		140	calculated	586984	4506712	confirmed		
unknown (Northeast of Station)		240	calculated	586980	4506772	confirmed		

* Elevated receptor set utilized for modeling in support of Boiler 100 reactivation in 2001

** If height is unknown, building height is calculated as 16 ft for first story' 10 ft for each additional story; receptors positioned on buildings at 10 m intervals, beginning at 40 meters above grade



	Consolidated Edison Company of New York, Inc. July 2007	**2005 – 2006 Daily HA Station Steam Flow Sendout (Annual)**	Figure 7-7 www.ensr.aecom.com

Number of Days

REDACTED

	Consolidated Edison Company of New York, Inc. July 2007	**2005 – 2006 Daily HA Station Steam Flow Sendout (Winter)**	Figure 7-8 www.ensr.aecom.com

7.4.20.2 Modeling Results

REDACTED

Net Benefits

REDACTED

REDACTED

Table 7-12
Con Edison - Hudson Avenue Repowering - Preliminary Modeling
Model Output Processing - Option 3A Short-Term (24 hour) Impacts

REDACTED

Table 7-12 (Continued)
Con Edison - Hudson Avenue Repowering - Preliminary Modeling
Model Output Processing - Option 3A Short-Term (24 hour) Impacts

REDACTED

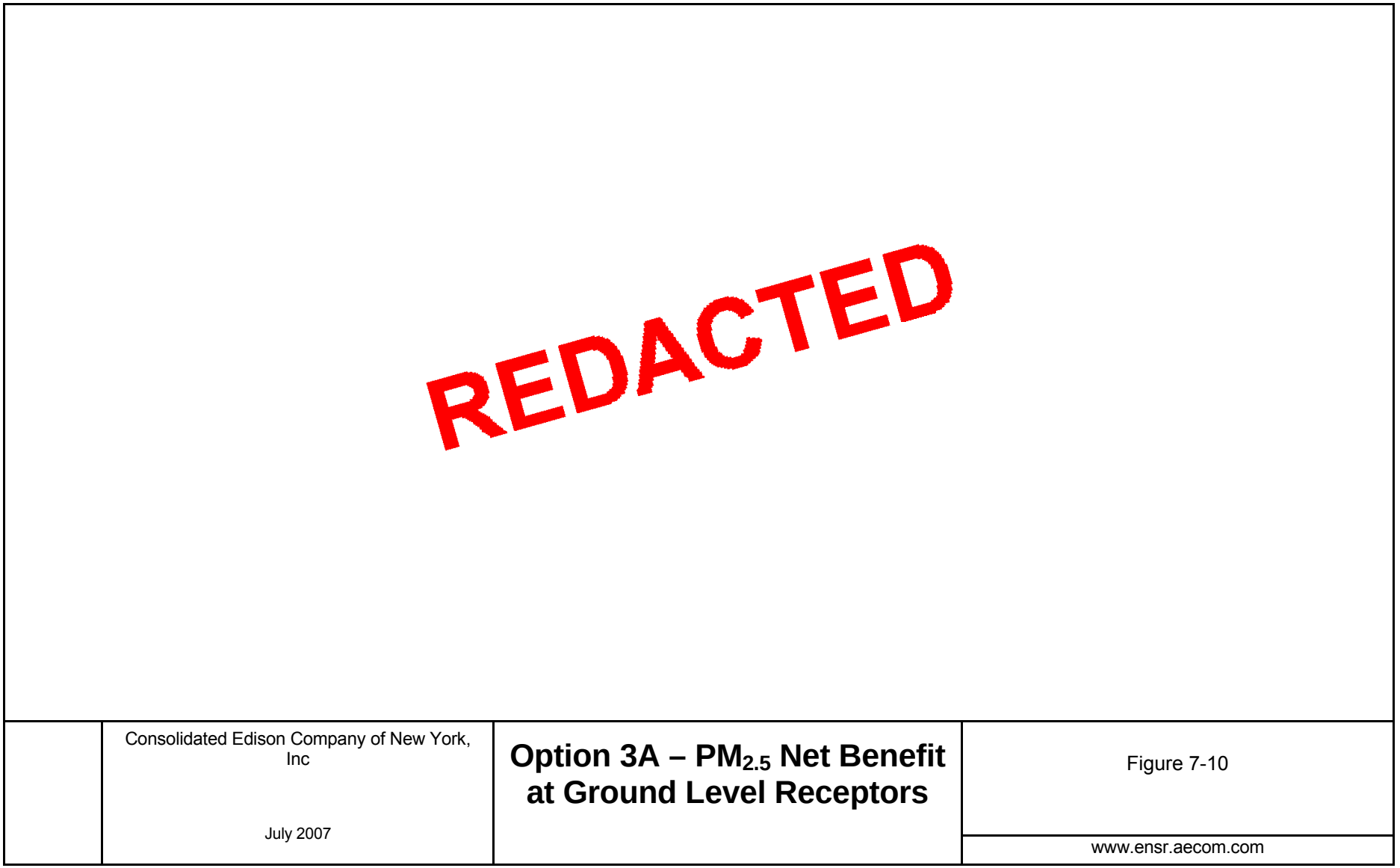
Table 7-13

AERMOD Model Results - Option 3A* - Maximum Predicted Impact For Building Elevated Receptor Grid

REDACTED

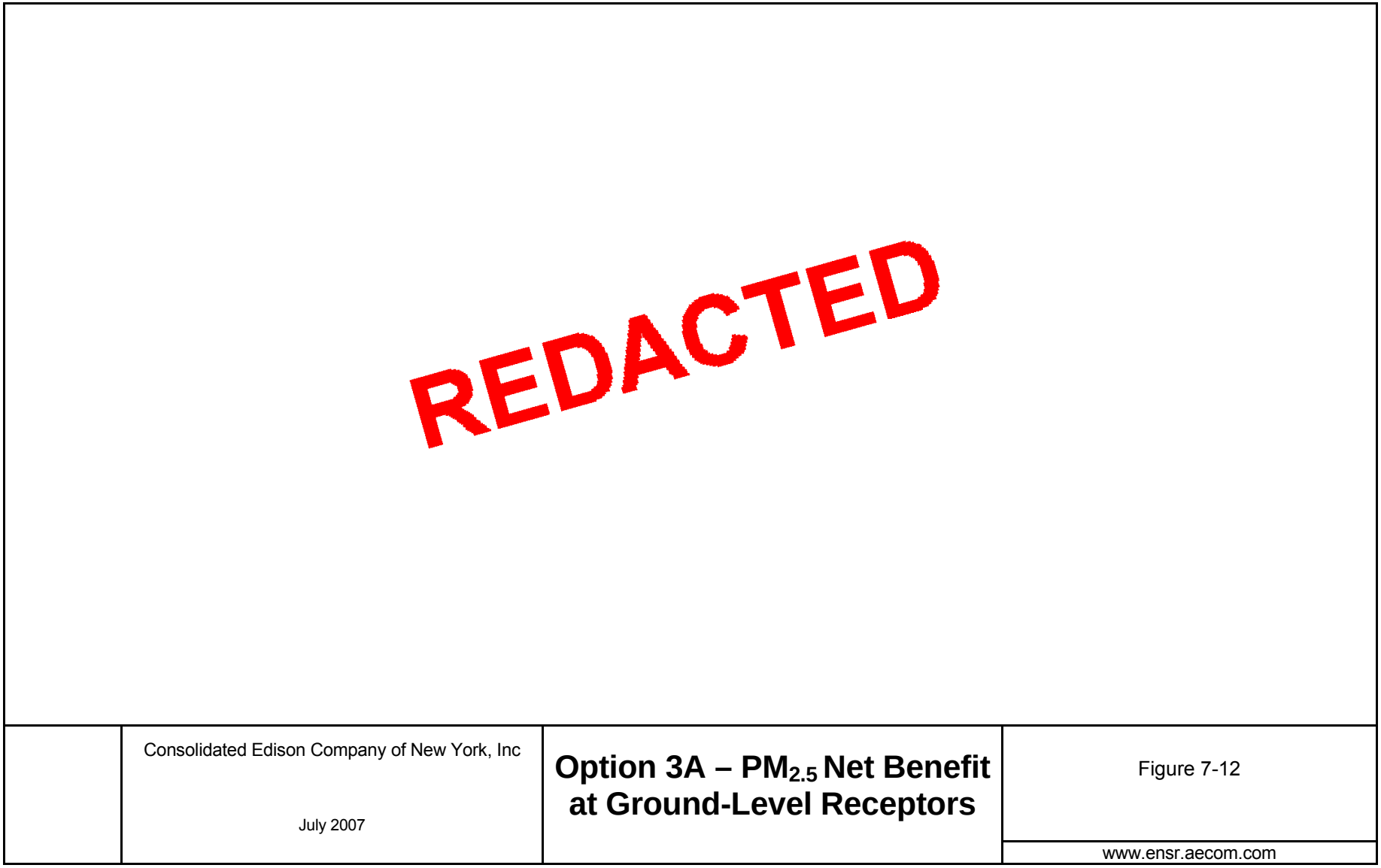
* Option 3A – 2373 MMBtu/hr heat input
** Based on predicted impacts using ULSD, the $PM_{2.5}$ SIL would be exceeded with and without net impact modeling using the LSD emission rate.

	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – $PM_{2.5}$ Net Benefit at Elevated Receptors**	Figure 7-9 www.ensr.aecom.com

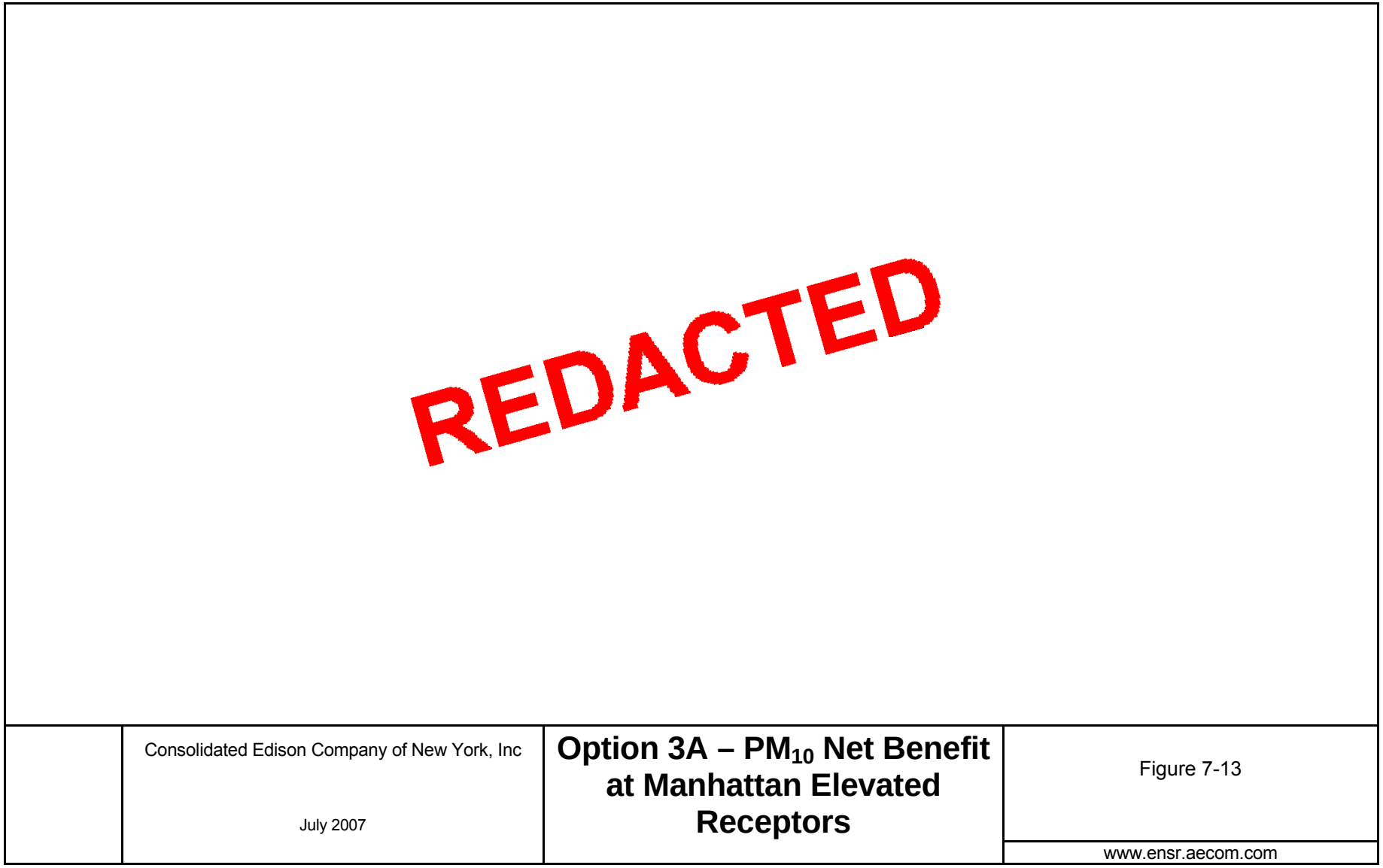


	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – $PM_{2.5}$ Net Benefit at Ground Level Receptors**	Figure 7-10 www.ensr.aecom.com

	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – $PM_{2.5}$ Net Benefit at Elevated Receptors**	Figure 7-11 www.ensr.aecom.com



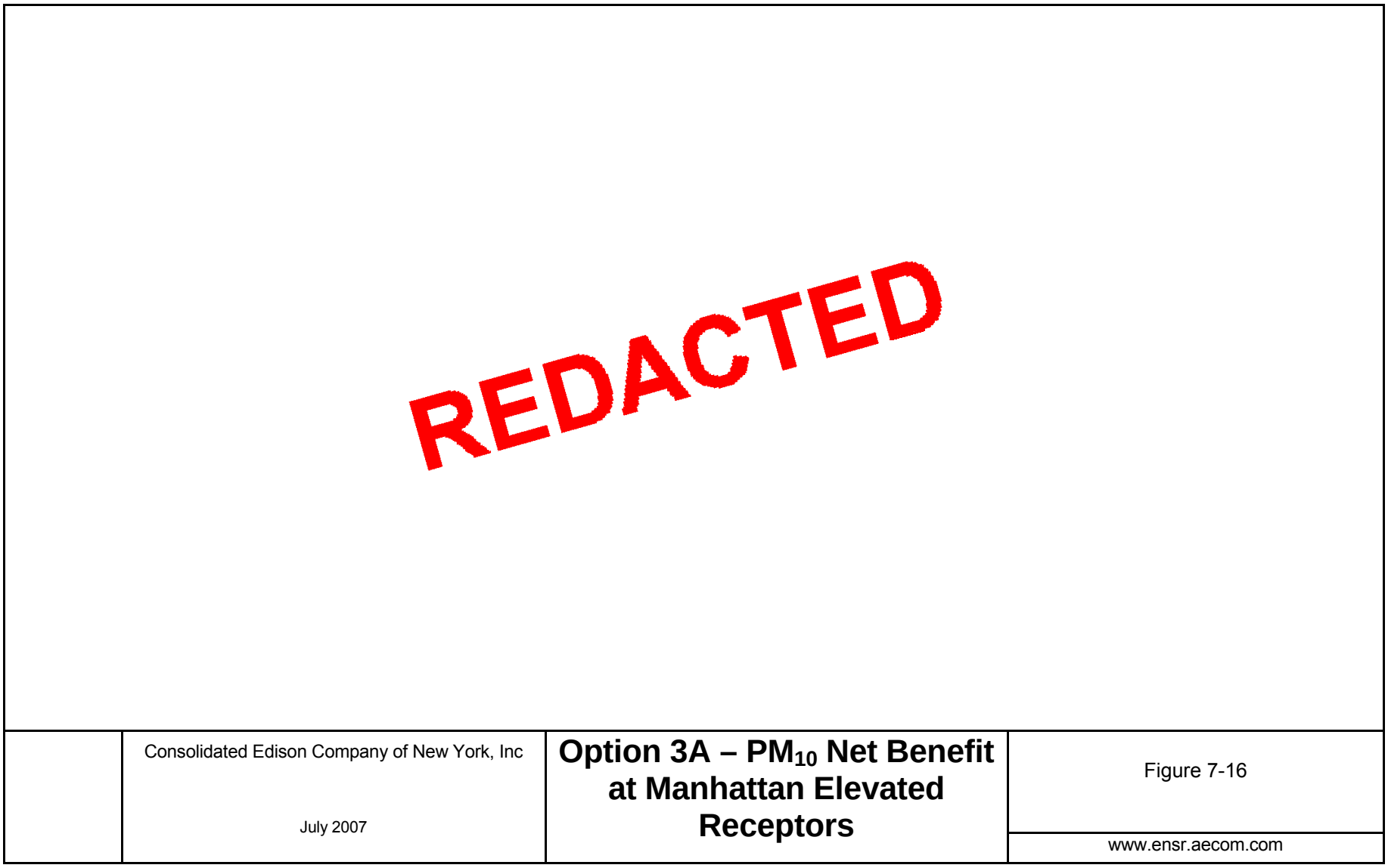
	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – $PM_{2.5}$ Net Benefit at Ground-Level Receptors**	Figure 7-12 www.ensr.aecom.com



	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – PM_{10} Net Benefit at Manhattan Elevated Receptors**	Figure 7-13 www.ensr.aecom.com

	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – PM_{10} Net Benefit at Manhattan Ground-Level Receptors**	Figure 7-14 www.ensr.aecom.com

	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – PM_{10} Net Benefit at Manhattan Ground-Level Receptors**	Figure 7-15 www.ensr.aecom.com



	Consolidated Edison Company of New York, Inc July 2007	**Option 3A – PM_{10} Net Benefit at Manhattan Elevated Receptors**	Figure 7-16 www.ensr.aecom.com

7.4.21 Title V Modification

The NYSDEC's Operating Permit requirements are codified in 6 NYCRR Subpart 201-6, *Title V Facility Permits*. A facility is required to obtain a Title V facility permit if it qualifies as a major source; otherwise, a state facility permit must be obtained in accordance with 6 NYCRR 201-5. A fossil-fuel-fired steam electric plant with a heat input capacity of more than 250 MMBtu/hr is considered a major source if the facility has the potential to emit 100 tpy or more of any regulated pollutant or if the facility has the potential to emit 10 tpy or more of any individual hazardous air pollutant (HAP) or 25 tpy or more of an aggregate of all HAPs. Also, stationary sources in ozone nonattainment areas are major sources if the potential to emit ozone precursors exceeds the following thresholds:

- Marginal or moderate ozone nonattainment area: 100 tpy NOx or 50 tpy VOC;
- Severe ozone nonattainment area: 25 tpy NOx or 25 tpy VOC; and
- Ozone transport region (OTR): 100 tpy NOx or 50 tpy VOC.

Note that the HA Station is located in an area currently designated moderate ozone nonattainment, and it lies within the Northeast OTR.

In addition, a facility may be required to obtain a Title V permit if it is subject to the NSPS, NESHAP, or Acid Rain provisions of the Clean Air Act.

The existing equipment (LP Boilers and peaking combustion turbines) at the HA Station has potential emissions of individual criteria pollutants that exceed 100 tpy and is therefore a major facility. The facility's Title V permit was issued with an effective date of October 18, 2005 (Modification 1) and an expiration date of August 12, 2007.

The project will require a modification of the HA Station's Title V facility permit. Permit modifications are categorized as minor or significant. Minor modifications are those that do not exceed criteria specified in 6 NYCRR §201-6.7, *Permit renewal and modification*. Among other qualifiers, minor modifications include actions that:

- Do not require significant changes to existing monitoring, reporting, or recordkeeping requirements;
- Do not require a case-by-case determination of a Federal emission limitation or other Federal standard;
- Are not modifications under any provision of Title I of the Act, including nonattainment New Source Review (Part 231 of this Title) or the PSD regulations (40 CFR 52.21).

Significant permit modifications are those that are not minor modifications.

The upgrade to Boiler 100 and the installation of the new boilers will likely require a significant modification of the Title V facility permit The modification application is the same form used for initial Title V permits and permit renewals, and it will identify the new sources, fuels, operating scenarios, requested emission limits, and applicable requirements. The LP Boilers will need to be removed from the Title V permit when the new boilers commence operation.

7.5 Other Environmental Issues

7.5.1 Non-hazardous and Hazardous Waste Disposal

The cost of transportation and disposal of solid and hazardous wastes have been estimated for Option 3A repowering. This study was based on a review of the following information:

- Report entitled "Summary Of Investigation and Remedial Plan, Hudson Avenue Generating Station, Brooklyn, New York," prepared by Dvirka And Bartilucci Consulting Engineers,
- Plot plan of Option 3A dated January 29, 2007,
- An estimate of the soil and dewatering water quantities for disposal (estimate 1), and an estimate of the dimensions of the building footprints (estimate 2). These estimates were supplied by PB Power in emails dated April 24, 2007.

The "Summary of Investigation and Remedial Plan" report was reviewed. No analytical data were found within the footprint of the proposed new boilerhouse. Some soil characterization was found for samples collected within the HA Station site; however, no data for soil near the Option 3A footprint was available to determine whether the soil that would need to be excavated would be classified as characteristic hazardous (as that term is defined in the Resource Conservation and Recovery Act).

Estimate 1 (Table 7-14) is based on Option 3A estimate for construction excavation provided by PB Power that produced ***[REDACTED]*** of hazardous soil. The depth of excavation was given as five feet. If dewatering is needed, it is assumed that the dewatering contractor would treat and discharge the water at the site. (If discharged to the East River, then a construction SPDES Permit would be required.) Therefore, no estimate is provided for management of the water.

Estimate 2 (Table 7-14) for Option 3A was based on a different footprint area than Estimate 1. Since the depth of excavation was not indicated, the same five foot excavation depth described in Estimate 1 was assumed, and calculated soil volumes were based on the Option 3A building dimensions and footprint provided. Estimated transportation and disposal costs for both hazardous / non-hazardous quantities are provided to indicate the range in costs ***[REDACTED]***).

Estimates of transportation and disposal costs were obtained from a contractor experienced in the management of both hazardous and non-hazardous wastes. Quantities were not available for demolition debris requiring disposal; therefore, only a unit cost was estimated ($150 per ton and a $182 fuel surcharge per truckload). Since asbestos, lead paint, and hazardous materials are typically removed from buildings prior to demolition (they would either present a dust problem during demolition, or would cause the debris to be classified as hazardous waste), the unit cost provided assumes that the demolition debris is not a hazardous waste.

These estimates do not include the costs associated with excavation, demolition, oversight of transportation and disposal (e.g., review of manifests, bills of lading, weight tickets, etc.) and pre-characterization of soils or other sampling as may be required by the receiving disposal facility.

Table 7-14 Estimate of Soil Transportation and Disposal Costs - Option 3A

Estimate 1

ConEd Soil Removal/Remediation - Assumptions of Site size, soil quantity, etc.

Truck Loads = 22 tons/truck assumed

Transportation and Disposal			

Estimate 2

ConEd Soil Removal/Remediation - Assumptions of Site size, soil quantity, etc.							

REDACTED

Volume = building length x building width x feet (assumed depth of excavation depth of excavation)
Cubic feet / 27 = cubic yard
Tons = cubic yards x (assumed multiplier for soil)
Truck Loads = 22 tons/truck assumed

Transportation and Disposal			

Notes:
1. Costs based on budgetary estimates provided by Environmental Waste Minimization, Inc. (EWMI)
2. Hazardous Landfill - Clean Earth of New Jersey, Kearny, NJ; Non-Hazardous Landfill - Soil Safe of Logan, New Jersey
3. Construction Debris (non-hazardous) quoted by EWMI at $150/ton, disposal at Onyx Greentree Landfill; $182 fuel surcharge/load still applies
4. According to EWMI, soils containing PCBs over 2 ppm but less than 50 ppm will be sent to Clean Earth of Hagerstown, Maryland for disposal; however, generator must prove that PCBs are not from a TSCA regulated source and costs per ton will increase by $30
5. Costs quoted above include regulatory sampling every 180 tons; initial sampling costs an additional $1200
6. Quantities and waste classifications based on an estimate of the soil quantities for disposal (estimate 1)
7. Actual soil quantities and soil contaminant concentrations above regulatory thresholds may affect costs
8. Petroleum contaminated soil is assumed to be non-hazardous

7.5.2 Environmental Justice

The Office of Environmental Justice in the USEPA defines environmental justice as:

> *the fair treatment and meaning full involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or social group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, and tribal programs and policies.*

The EJ analysis originated with the establishment of Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" (February 11, 1994). The order requires federal agencies to consider disproportionate adverse human health and environmental impacts on minority and low-income populations.

The focus of an EJ analysis is the determination of whether the construction and operation of a proposed facility would have both adverse and disproportionate impacts on an environmental justice community. USEPA Region 2 developed an "Interim Environmental Justice Policy" (December 2000), which defines the approach and methodology that Region 2 will use to evaluate and assess EJ communities and their concerns.

USEPA Region 2 Interim Policy

The USEPA Region 2 guidance (December 2000) identifies several steps associated with an EJ study. If an area exceeds specified demographic thresholds that trigger a full EJ analysis, then it must be ascertained whether a disproportionately high environmental impact will be experienced in a minority or low-income segment of the community surrounding the Project site. These steps include:

- Definition of the boundaries of the Community of Concern,
- Determination of applicable USEPA EJ thresholds, and
- Evaluation of whether a minority or poverty level segment of the population is present and, if so, perform an evaluation ("environmental burden" analysis) to determine if disproportionately high environmental impacts exist in that area.

In addition, where the demographic and environmental burden analysis indicates an EJ community, the USEPA has developed guidance for public involvement actions. The Region 2 guidance recommends the use of a geographic information system (GIS)-based demographic mapping tool to conduct site-specific EJ analyses. The procedures that would be employed for each of these steps are described below.

Community of Concern

The Community of Concern (COC) encompasses the local area surrounding the site that could potentially be subject to environmental effects resulting from the construction and operation of the Project. EPA Region 2 uses the term COC to refer to a community that is the subject of an EJ analysis. A one-mile radial boundary around a Project has been considered reasonable to represent a COC for EJ evaluations for similar projects.

USEPA Thresholds

The socioeconomics (i.e., minority population and low-income population) of the COC are then compared to threshold percentages developed by the USEPA Region II, based on US Census data.

For the urban setting in the State of New York, the total minority population guideline is 48.5 percent and the low-income population threshold is 24.8 percent.

Environmental Burden

If a minority or poverty level segment of the population is present, background air quality data and a discussion of the air quality impacts (with respect to USEPA-defined SILs) that result from the addition of the Project will be used to determine if the community would experience disproportionately negative air quality impacts due to the addition of the Project. Other environmental indicators including traffic, visual resources, noise, toxic release inventories and hazardous waste handlers will also be used to determine if the if the community would experience disproportionately negative environmental impacts due to the addition of the Project.

Community Involvement Guidelines

The Region 2 Interim policy presents guidelines for community involvement. These guidelines provide Regional program managers and staff with guidance for conducting effective and early outreach, and to outline steps that they can take to determine the appropriate level and type of outreach that will provide communities with environmental justice concerns the opportunity to have input into EPA's work and decision-making processes. The outreach steps may include:

- Identification of community stakeholders and concerns;
- Preparation of a community involvement program;
- Involvement of Community through public meetings, development of communication materials and technical seminars.

NYSDEC Guidance-Purpose and Regulatory Background

The New York State Department of Environmental Conservation (NYSDEC), environmental justice (EJ) policy focuses on improving the environment in under-served communities (specifically low income and minority communities), and addressing disproportionate adverse environmental impacts that may exist in those communities.

On March 19, 2003, the NYSDEC announced the completion of the Department's Environmental Justice Policy, a measure aimed at promoting greater involvement of minority and low-income communities in NYSDEC's permitting and project review process. The policy, *CP-29, Environmental Justice and Permitting* became effective on April 18, 2003. The final policy was based on input from the NYSDEC staff, the NYSDEC Environmental Justice Advisory Group and comments submitted by the public. A procedure is set forth that has been incorporated into the NYSDEC permit review process when the NYSDEC serves as Lead Agency under the State Environmental Quality Review Act (SEQR). When the NYSDEC is not the Lead Agency under SEQR, the NYSDEC shall implement the procedure to the extent permitted by law.

This policy requires NYSDEC to provide enhanced accessibility to public permit information; use geographic information system screening tools and US Census data to identify potential environmental justice areas; use enhanced public participation; and public outreach mechanisms and issue guidance on how to conduct enhanced public participation. The policy establishes a methodology for conducting a preliminary screen to identify potential adverse environmental impacts and determine whether the impacts at a specific location are likely to affect an area containing a significant minority population and/or low income population. The policy also requires that scoping of issues be conducted when a potential environmental justice area is identified and an Environmental Impact Statement is required. As noted in the policy, "this policy will not be construed to create any

right or benefit, substantive or procedural, enforceable by law or by equity by a party against the DEC or any right to judicial review. This policy may be subject to change at the discretion of DEC."

Procedure

The NYSDEC mirrors the analysis set forth by USEPA Region 2. The first step in this policy is to "identify potential adverse environmental impacts and the areas to be affected." NYSDEC staff in the Division of Environmental Permits should be consulted to identify potential adverse environmental impacts associated with the proposed project and the area to be affected. For a typical power project, a one-mile radius has been accepted to be an appropriate distance (if not conservative with respect to expected project impacts) for the preliminary environmental justice screening. This distance may be dependent on the extent of air impacts associated with a project, such as the Significant Impact Area.

The next step is to "determine whether potential adverse environmental impacts are likely to affect a potential environmental justice area." A "potential environmental justice area" is defined as a minority or low-income community that may bear a disproportionate share of the negative environmental consequences resulting from industrial operations or the execution of programs and policies. A GIS screening tool along with US Census data (block groups) are used to determine whether potential environmental impacts from the proposed action are likely to affect a potential environmental justice area. The GIS is used to determine if any census block groups residing within the affected area meet the thresholds described below.

The NYSDEC policy includes thresholds (similar to the USEPA Region 2), for low-income and minority communities as follows:

- Minority community means a census block group, or contiguous area with multiple census block groups, having a minority population equal to or greater than 51.1 percent of the total population in an urban area (based on 2000 Census data).
- Low-income community means a census block group, or contiguous area with multiple census block groups, having a low-income population equal to or greater than 23.59 percent of the total population (based on 2000 Census data).

If a census block group(s) population triggers the above thresholds, the proposed action is considered to affect a potential EJ community, and the NYSDEC requires an enhanced public participation plan. The NYSDEC Division of Environmental Permits will provide an applicant with relevant information on EJ, including guidance for developing and implementing a public participation plan.

The NYSDEC updated "Tips for Preparing a Public Participation Plan" in February 2006. This guidance is for applicants that must actively seek public participation throughout the environmental review process and expands on the following topics. First, the applicant will submit a written Public Participation Plan as part of its complete application. The enhanced public participation plan process includes: identification of stakeholders to the proposed action, distribution of written information, meetings for the public, establishment of document repositories in or near the potential EJ area, and the composition of status reports including concerns raised to-date and all resolved outstanding issues. Upon completion of the plan, the applicant submits written certification demonstrating compliance with the plan. The NYSDEC Office of Environmental Justice is available for consultation regarding Public Participation Plans.

Where NYSDEC is the lead agency and a potential EJ area is identified, a Full Environmental Assessment Form shall be completed under the State Environmental Quality Review Act (SEQRA). The Policy sets forth additional procedures regarding a coordinated NYS review, determining

significance (if NYSDEC is the lead agency and determines that the action may include the potential for at least one significant adverse environmental impact, preparation of an EIS is required), scoping, EIS content, and alternative dispute resolution.

7.5.2.1 Analysis of Minority Status

The NYSDEC and USEPA Region 2 policies define "minority communities" for urban areas as those having a minority population of 51.1 percent and 48.5 percent, respectively. The USEPA's Geographic Assessment Tool was utilized to identify the percent minority in the population surrounding the Project (within a one-mile radius). This analysis resulted in 105,852 total persons located within one mile of the Project. Using 2000 Census data, the assessment tool calculated a 69.4 percent minority population within the one-mile radius. "Percent minority" includes all races except Non-Hispanic white persons. Table 7-15 presents the racial breakdown within a one-mile radius of the HA Station. Figure 7-17 illustrates the percent minority, by census block. The map displays areas near the HA Station that include a "greater than 40 percent" minority population. The analysis concludes that there are potential minority COCs within a one-mile radius of the HA Station.

7.5.2.2 Analysis of Low Income Status

The NYSDEC and USEPA Region 2 policies define "low-income communities" for urban areas as those having a low-income population of 23.59 percent and 24.8 percent, respectively. The USEPA's Geographic Assessment Tool was again utilized to identify the percent of persons below the poverty level in the population surrounding the HA Station (within one-mile radius). Of the 105,852 total persons in the one-mile radius, 37,407 persons, or 35.3 percent, were below poverty level according to the 2000 Census data. Figure 7-18 displays the percent below poverty, by block group within the one-mile radius. Accordingly, the analysis concludes that there are potential low-income COCs within a one-mile radius of the HA Station.

7.5.2.3 NYSDEC County Map of Potential EJ Areas.

The above results, specific to the vicinity of the HA Station, are similar to the NYSDEC preliminary EJ screen for Kings and New York Counties (refer to Figures 7-19 and 7-20), which identify potential EJ communities in the vicinity of the HA Station (based on data from the 2000 U.S. Census). According to the NYSDEC, due to the scale of the maps, some potential environmental justice areas may not appear on the County maps. Therefore, these maps should be used as a general representation only. The NYSDEC recommends applicants contact the Office of Environmental Justice to obtain a detailed map of the geographic area of interest.

Table 7-15

Socioeconomic Data (2000) for Population Within 1-mile Radius of Hudson Avenue Station

	Persons (%)
Total Persons	105,852 (100%)
Percent Minority[1]	69.4%
Persons Below Poverty Level[2]	37,407 (35.3%)
Breakdown by Race	
White[3]	42,929 (40.6%)
African American[4]	21,333 (20.2%)
Hispanic Origin[5]	27,729 (26.2%)
Asian/Pacific Islander[6]	21,364 (20.2%)
American Indian[7]	309 (0.3%)
Other Race[8]	14,809 (14.0%)
Multiracial	5,108 (4.8%)

Notes:

(1) **Percent Minority** Includes all races except Non-Hispanic white persons. Percent minority is computed by dividing total minority count by a total sample count of persons.

(2) **Persons below Poverty level** Number of Persons Below Poverty level; Ratio of Income in 1989 to Poverty level, for persons whom poverty status is determined.

(3) **White** Percentage of white persons. Computed by dividing total number of white non-Hispanic persons by total sample count of persons.

(4) **African-American** Percent of African-American persons. Computed by dividing total number of African-American persons by total sample count of persons.

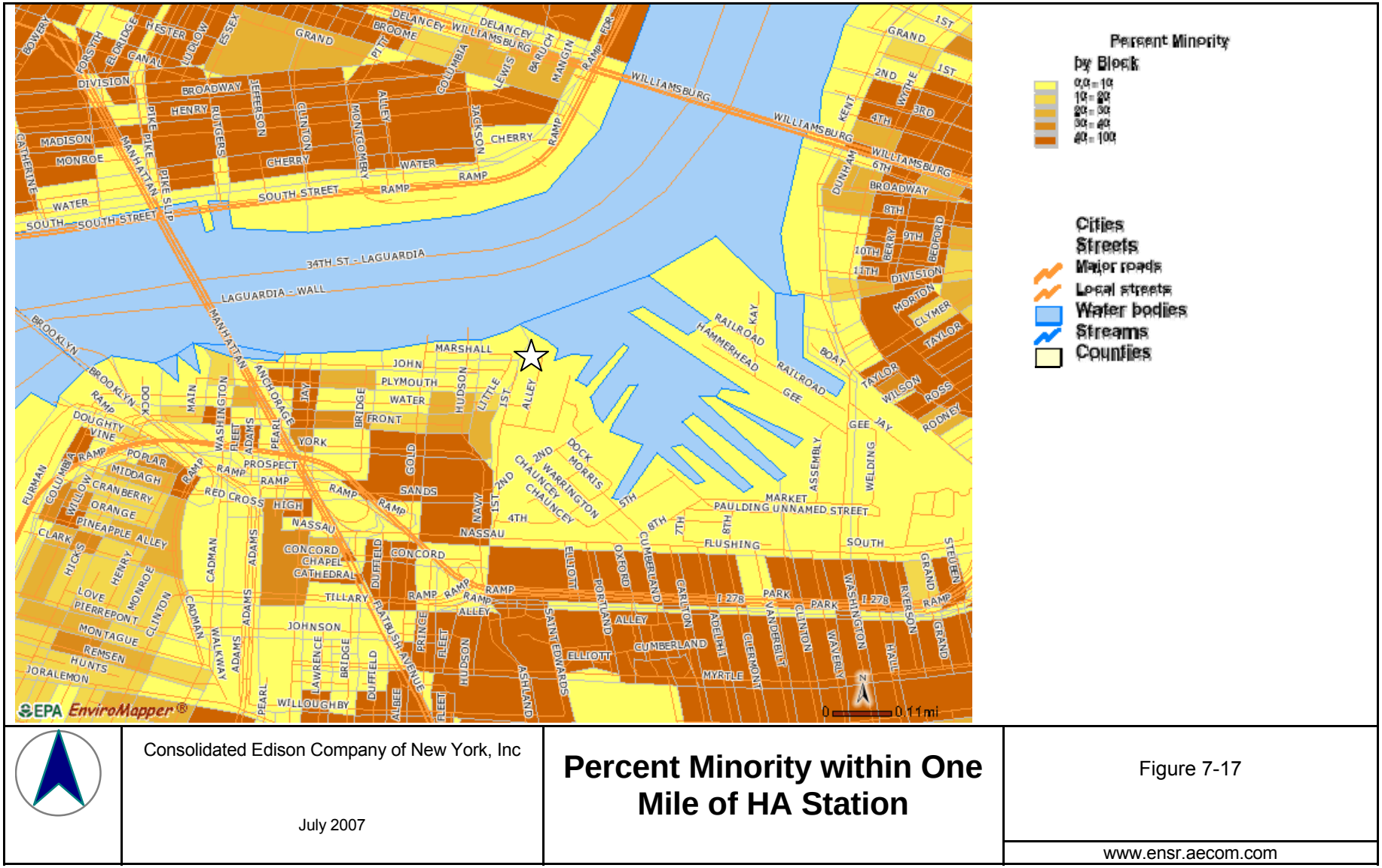
(5) **Hispanic Origin** Percent of persons of Hispanic origin (includes all races). Computed by dividing total number of Hispanic persons by total sample count of persons. This percent is not included in Race Breakdown total of 100%; however non-white Hispanic origin population is included in the Percent Minority total.

(6) **Asian/Pacific Islander** Percent of Asian/Pacific Islander persons. Computed by dividing total number of Asian/Pacific Islander persons by total sample count of persons.

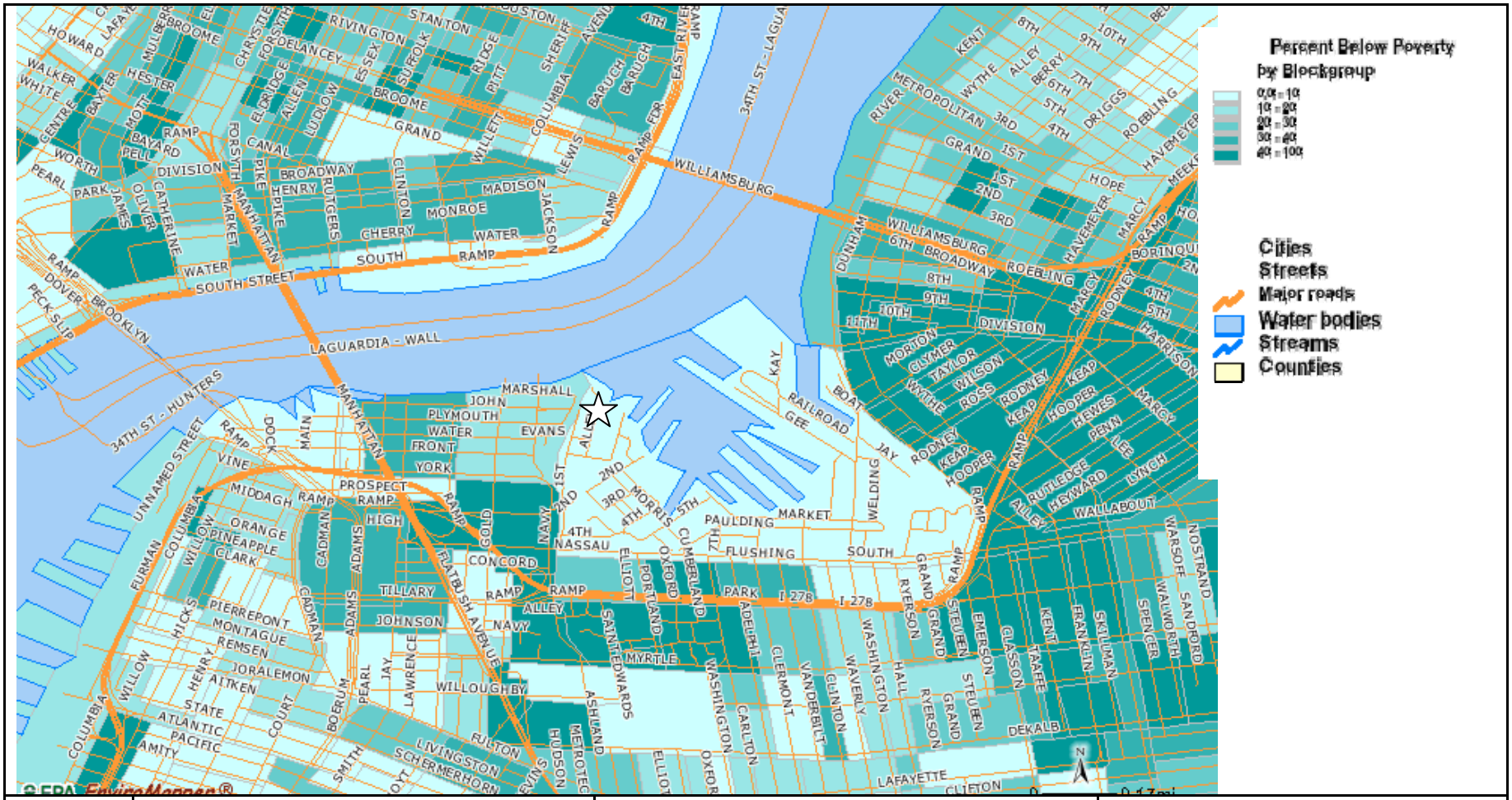
(7) **American Indian** Percent of American Indian persons. Computed by dividing total number of American Indian persons by total sample count of persons.

(8) **Other Race** Percent of persons of other races not listed above. Computed by dividing total number of persons of other races by total sample count of persons.

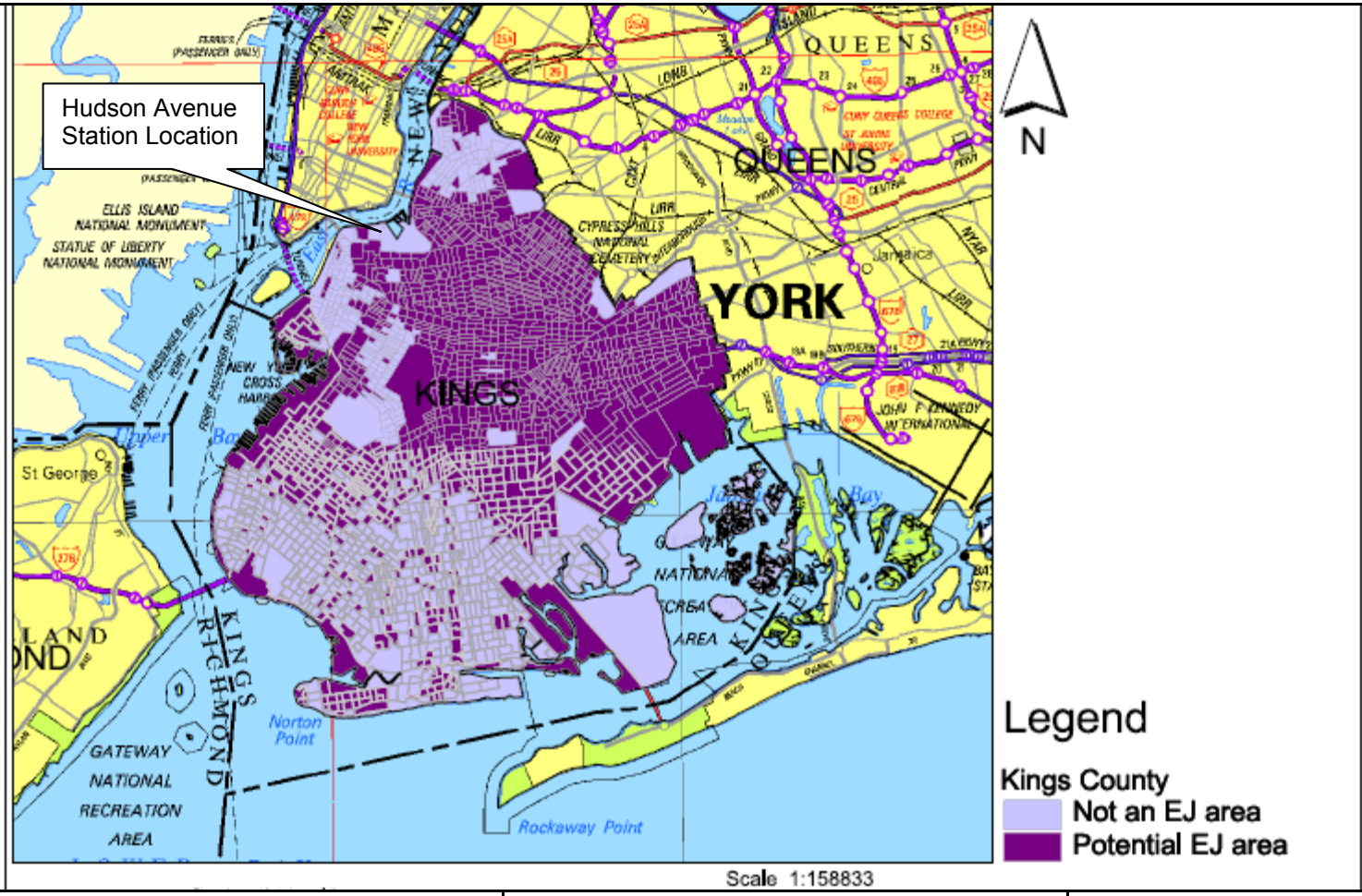
Source: USEPA EJ Assessment Tool using 2000 Census data



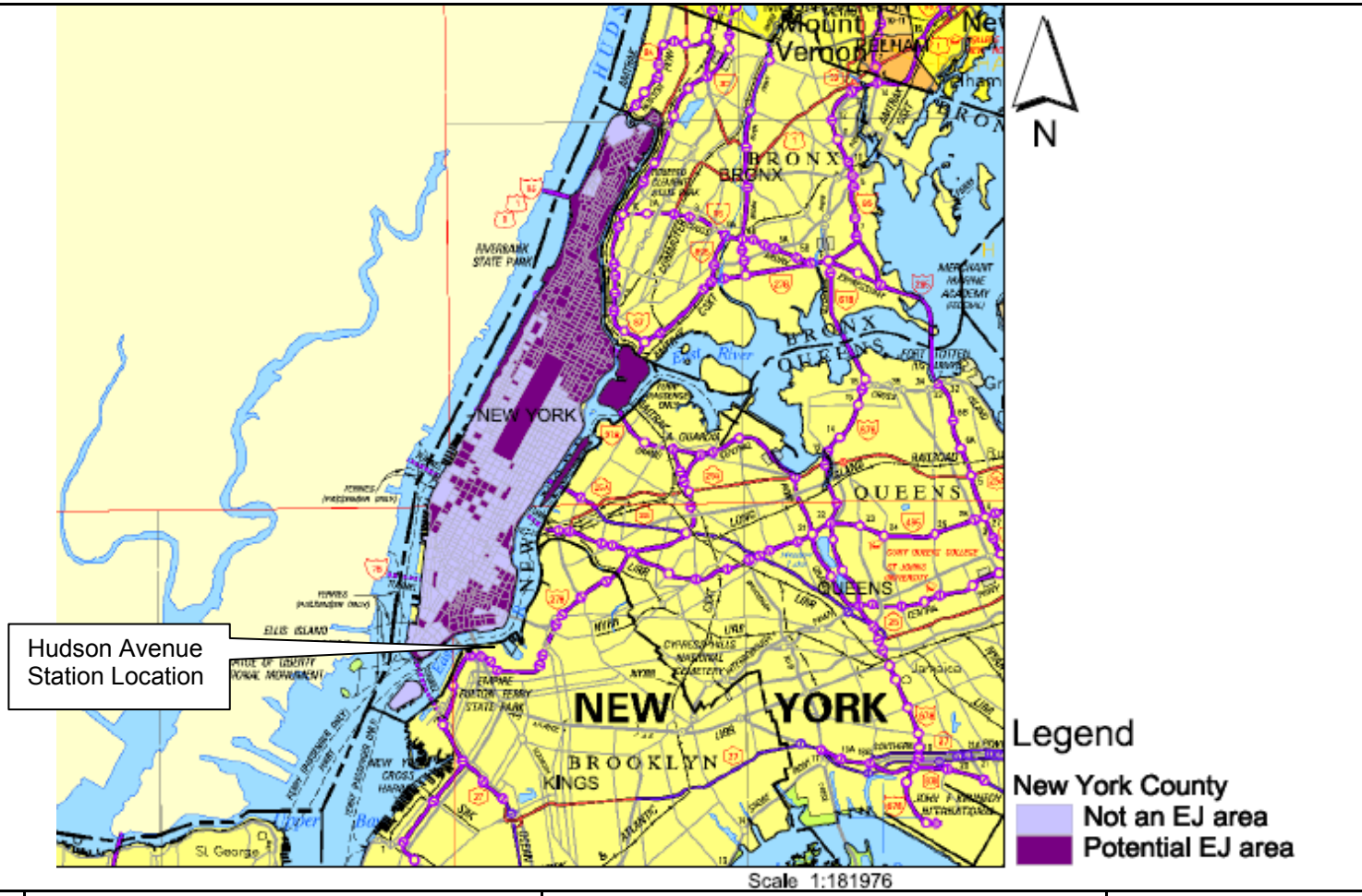
	Consolidated Edison Company of New York, Inc July 2007	**Percent Minority within One Mile of HA Station**	Figure 7-17 www.ensr.aecom.com



	Consolidated Edison Company of New York, Inc July 2007	**Percent Below Poverty within One Mile of HA Station**	Figure 7-18 www.ensr.aecom.com



Consolidated Edison Company of New York, Inc July 2007	**NYSDEC EJ Preliminary Screen – Kings County** Source: http://www.dec.ny.gov/public/333.html	Figure 7-19 www.ensr.aecom.com



Consolidated Edison Company of New York, Inc

July 2007

NYSDEC EJ Preliminary Screen – New York County

Source: http://www.dec.ny.gov/public/333.html

Figure 7-20

www.ensr.aecom.com

7.5.3 Preliminary Noise Assessment

7.5.3.1 Regulations

Noise related to the operation of new industrial projects in NYC is restricted by the requirements of the following guidelines:

- New York Administrative Code, Title 24, Subchapter 6, Section 24-243 (ambient noise quality zones, criteria, and standards)
- City Environmental Quality Review (CEQR) Technical Manual, Chapter R. Noise
- Modified Composite Noise Rating (CNR) Analysis

Noise controls will need to be added to the design of the Option 3A such that the project's total noise emissions meet the strictest criteria of the three guidelines, the NY Administrative Code (Code). The Code limits the station's sound levels experienced at the property line of other ambient noise quality zones (that is, noise sensitive receptors). N-1 zones are the quietest noise quality zones usually consisting of low-density residential areas, and are designated as land-use zones R-1, R-2, and R-3. N-2 zones are higher density residential areas designated as land-use zones R-4 though R-10. N-3 zones are commercial and manufacturing land-use zones. The Code limits the noise from the HA Station at the noise quality zone property lines to a maximum sound level (measured as a one-hour L_{eq}) accordingly:

	N-1 Zones	N-2 Zones	N-1/N-2 Zones[a]	N-3 Zones
Day-time	60 dBA	65 dBA	55 dBA	70 dBA
Night-time	50 dBA	55 dBA	45 dBA	70 dBA

[a] Applies to N-1 and N-2 zones if the existing sound levels are less than 55 dBA. This applies to new sources only; existing noise sources are exempt from this additional requirement.

The foregoing discussions on noise assessments in this report will assume that N-1 and N-2 zones adjacent to the HA Station have existing sound levels less than 55 dBA. (This assumption would be confirmed through the conduct of background noise measurements if Option 3A is selected). Therefore, since the Option 3A Boiler 100 / new boilers being evaluated will be considered as new noise sources, the assessments will discuss the probable level of noise controls needed for Boiler 100 / new boilers to achieve a night time noise limit of 45 dBA at the nearest residential zone (N-1 and N-2). The 70 dBA requirement at the nearest commercial or manufacturing property (N-3) also needs to be satisfied. Note that portions of the HA Station that will not be modified may still influence compliance with the Code by contributing additional noise, and a station-wide noise assessment will need to be undertaken if Option 3A is selected

7.5.3.2 Receptors and Assessment Criteria

As previously discussed, noise generated from the operations of the new equipment at the HA Station will need to be less than 45 dBA at the nearest residentially zoned (noise quality zones N-1 or N-2 zone) property line or 70 dBA at the nearest commercial or manufacturing zone (noise quality zone N-3) property line. The following summarizes the nearest distances to where the Option 3A repowering would occur: the new boilerhouse (nearest the Zone N-2) and Boiler 100 boilerhouse (nearest Zone N-3 receptors):

Zone	Location	Distance
N-2	Southeast block of Hudson & Plymouth Aves.	120 ft
N-3	Southwest block of John St. & Hudson Ave.	220 ft

Note that there are no N-1 zones in the vicinity of this Station. Based on normal sound propagation over distances, the 45 dBA at the N-2 zone will be the limiting requirement. That is, if the Project meets the 45 dBA at 120 feet requirement, it will also meet the 70 dBA at 220 feet, but not visa versa.

7.5.3.3 Noise Sources Option 3A

Noise sources from Option 3A are two 367 MMBtu boilers that will be located in either a metal or masonry building, and the upgrade of Boiler Unit 100 (1639 MMBtu) in the existing brick Annex building (EP0005). The average dimensions of the new boiler building will be (based on scaled site plans), 49 m (160ft.) L x 15 m (49ft.) W x 21 m (69ft.) H. The average size of the existing Annex building is, 51 m (165ft.) L x 39 m (128ft.) W x 48 m (157ft.) H. The only other noise source considered in this noise prediction is one 1,200 MMBtu per hour dump condenser mounted outdoors on the rooftop of the new boiler building, and a common stack (existing) at a height of 109 m (356 ft.) above grade located to the immediate west of the of the existing Annex building.

In order to estimate Option 3A noise, assumptions were made on interior wall treatments and wall transmission loss. In addition, since specific boilers have not yet been identified, estimated sound levels for each boiler and exhaust were based on typical sound levels corresponding to the boiler size/capacity. Assumptions used for the noise modeling are summarized below:

- two boilers (approximately 367 MMBtu = 32.3 MW) located inside building with sound power level of 94 dBA (each boiler),
- Boiler 100 upgrade (approximately 1639 Btu = 144.2 MW) located inside existing brick Annex building with sound power level of 104 dBA,
- dump condenser mounted outdoors on roof of new boiler building (21 meter or 67 ft. height) with sounds pressure level not exceeding 85 dBA at 3 feet (1 meter),
- no acoustical treatments within the boiler building,
- masonry new boiler building and Annex building with a wall sound transmission loss: 34 dBA,
- metal new boiler building wall sound transmission loss: 20 dBA overall,
- boiler building roof sound transmission loss: 28 dBA, and
- residential noise receptor heights of 2 meters (7 ft.), 10 meters (32 ft.) and 20 (66 ft.) meters above grade.

7.5.3.4 Noise Estimate and Mitigative Strategies

Building transmission losses were estimated based on typical wall design and transmission loss estimates including those used for the Con Edison East River Re-powering Project. Acoustic modeling of noise sources was conducted using CadnaA software which calculates the attenuation of sound during propagation outdoors as specified in ISO 9613. Predicted Option 3A sound levels were calculated as several distances out to the nearest N-2 receptor (approximately 150 meters), and included any reflection/barrier effects from the existing LP Boilerhouse east of the new boilerhouse, and the existing Annex building located north of the residential receptor area (south of the new

boilerhouse). Results are presented in Table 7-16. As indicated in Table 7-16, sound levels were predicted at the nearest receptor for both the sound level including the dump condenser, and the sound level excluding the noise contributions from the dump condenser. As indicated in Table 7-16, unmitigated sound levels at from the Project, including the contributions from the dump condenser, are predicted to be 59 to 60 dBA at the nearest residential area for either masonry or steel building designs for the new boilerhouse.

The results excluding the dump condenser sound presented in Table 7-16 indicate that the community noise from Option 3A is predominantly due to sound from the dump condenser located on the rooftop of the new boilerhouse.
Since this preliminary evaluation predicted Option 3A sound levels would exceed the 45 dBA limit, significant mitigative measures are likely to be required unless the following design changes are implemented:

- relocating the condenser to a location shielded from the receptors;
- moving the condenser farther from the receptor;
- partially surround the condenser with an acoustical wall in the direction of residential receptors, and/or
- procure quieter components (e.g. fans) for the condenser.

Since the dump condenser is predicted to be a significant source of noise for Option 3A that will likely affect compliance with noise limits, it is strongly recommended that manufacturer sound power level estimates and/or far-field sound pressure level guarantees be obtained to more accurately predict sound levels and quantify mitigative needs. A more comprehensive noise analysis utilizing vendor noise data, noise from project equipment other than boiler / dump condenser generated noise, and actual background noise data should be performed if Option 3A is selected.

Table 7-16
Predicted Sound Levels
Option 3A Preliminary Noise Assessment

Residential Receptor Height (meters)	Nearest Receptor (meters)	Option 3A (2 New and One Re-powered Boiler)	
		Sound Level With Dump Condenser (dBA)	Sound Level Excluding Dump Condenser (dBA)
		REDACTED	

[a] The nearest residentially zoned area, N-2, located approximately 36 meters south of the Project.
[b] The nearest commercially zoned area, N-3, located approximately 67 meters west of the Project.

7.5.4 State Pollutant Discharge Elimination System (SPDES) Permit

The make-up water for the new boilers and other Project-related processes will be obtained from the NYC water system. Therefore, no additional water will be withdrawn from the East River and the existing intake and discharge structures will likely not be an issue with the NYSDEC. Wastewater discharges from the facility are regulated by an existing SPDES permit, which includes three primary discharges as well as several internal discharges.

The Schematic of Wastewater Discharge Rev 7 (dated 5/02/05) as provided in the SPDES renewal application submitted on April 25, 2005 indicates that the discharge from outfall 001 described as service cooling water and low volume waste is inactive. Outfall 002 has noncontact cooling water flows of 1.44 million gallons per day (mgd), boiler blowdown of 0.08 mgd, floordrain and condensate flows of 0.04 mgd, and carbon filter backwash and sodium exchanger discharge of 0.04 mgd according to the renewal application. Outfall 003 has a stormwater discharge of <1 gpm. Given the date of the SPDES permit renewal application (April 25, 2005), discharges are assumed to cover the existing LP Boilers only.

Once Boiler 100 is upgraded and the new boilers are installed, the discharge flows for the LP Boilers will cease. Therefore it is likely that NYSDEC would establish interim limits for the period of testing and start up and another set to be applied after the LP Boilers are shut down. Based on the information currently available, it appears that total wastewater discharge may increase.

Because the intent is to operate new and old (LP Boiler) systems simultaneously through the new boiler shakedown phase and prior to initiating commercial operations, it will be necessary to obtain a SPDES permit modification to address increased flows and potential changes in quality during the testing and start up period.

At least 180 days is required for NYSDEC processing of SPDES mod application. All information required to prepare the application for submittal to NYSDEC should be available 90 days prior to the submittal date for the preparation of a SPDES mod.

A SPDES permit will be needed during construction if the current stormwater collection system is modified or if dewatering is required for the foundation excavation.

7.5.5 Water Allocation

The increased HA Station water allocation due to Option 3A will have no adverse impacts on the environment during operation. The NYCDEP, Bureau of Water and Sewer Operations, will design and construct the water supply mains to provide plant water and fire protection requirements (similar to ERRP). The NYCDEP is responsible for ensuring that the water supply to the HA Station for the Project will not adversely affect the other users of the same water supply.

7.5.6 Additional Environmental Issues

As explained in more detail below in section 7.6, the project will require numerous permits and environmental approvals, including the City Environmental Quality Review process. In addition to issues outlined above, such as air quality, water and noise, environmental issues including land use and zoning, visual resources, and traffic, will need to be addressed during the agency review process.

The HA Station is a large facility with numerous buildings and a relatively large site area and is surrounded by a mix of industrial buildings, as well as low-rise and high-rise housing. East of the HA Station is the former Brooklyn Navy Yard, which is currently used for industrial activities. The HA Station site is zoned M3-1, Heavy Manufacturing District by the 2001 NYC Zoning Resolution, which includes power and steam production as an allowable use. The zoning in the vicinity of the Hudson Avenue property is heavy manufacturing to the east and west. The East River is immediately north of the site, but the zoning to the north in Manhattan is also manufacturing. The HA Station boundary is, however near a residential district (R6B, General Residence District), to the south.

There are no significant architectural features associated with the existing facility structures. Nearby dense residential developments, recreational areas, historic sites, and sites of cultural significance could be considered to be visually sensitive to the repowering of a generating station. Such sensitive areas would be identified and visual impacts assessed during the permitting phase of the project. Examples of nearby areas with sensitive viewpoints include East River Park in Manhattan, the Manhattan Bridge, the Williamsburg Bridge, Brooklyn Bridge Park and neighboring residential buildings.

The HA Station has two structures housing boilers, the LP Boilerhouse and the Annex. The stacks currently at the site are 377 ft (LP Boiler) and 356 ft (Annex). The addition of the Option 3A boilerhouse between the LP Boilerhouse and the Annex building should not significantly change the appearance of the Station. The use of the existing 356 ft. stack supports this contention. An increased visible condensed water plume from the HA Station should not be a significant visual intrusion, especially since occasional visible condensed water plumes can already be observed from Station's stacks, as well as from other combustion sources in the New York City area. Condensed plumes from the Boiler 100 stack were present through 2004. Therefore, significant visual impact to the area is not anticipated for the Option 3A repowering project.

Narrow cobblestone streets near the site are considered to be historically significant. These streets may not be usable for individual construction worker vehicles and equipment access. Access by barge for delivery of major equipment components would likely be required. During construction, workers may be required to use offsite parking as an assembly location and travel to the site either by ferry or by bus. During operation of the new boilers, traffic would remain essentially unchanged from

current conditions, as the number of employees will be the similar to the current workforce needed for HA Station operation.

7.5.7 Public Outreach

A Public Involvement Program (PIP), which is the execution of public outreach, is defined by the NYS public service commission as a series of activities that provide "a variety of meaningful public participation opportunities by which public concerns can be identified as early as possible in (and throughout) the various stages of the decision making process. The PIP establishes communication between stakeholders and an applicant, and results in education of the public as to the specific project being proposed."

Con Edison previously developed a PIP for the East River Repowering Project (ERRP) that was designed to encourage early and ongoing participation by stakeholders and interested parties during all phases of the regulatory approval process. The PIP was intended to create a broad level of public awareness and understanding about the Project. The ERRP PIP was tailored to ensure that the concerns, needs and values of stakeholders are identified prior to key Project decisions, so that these decisions can reflect, to the extent practical, stakeholders' views. Concerns were solicited from the community, regulatory agencies and other stakeholders, and those concerns were considered when project decisions were made.

The Option 3A project includes the upgrade of Boiler 100. Adverse publicity associated with the reactivation of Boiler 100 in 2000 will likely stir community interest in the Boiler 100 upgrade.

The Public Outreach Program for the HA Station repowering would be similar to the PIP for the ERRP. A public outreach program is designed to be dynamic and to evolve as the project proceeds, in response to expressed public concerns and interests. The objectives of public outreach are to:

- Provide information about the project;
- Actively solicit input from a wide range of stakeholders;
- Respond to input and concerns raised by stakeholders; and
- Demonstrate compliance with enhanced public outreach required under regulatory programs such as SEQRA (CEQRA) and Environmental Justice.

The following stakeholder groups with specific interests in the project will be included in the public outreach efforts:

- Regulatory agencies;
- Environmental groups;
- Elected officials;
- Community leaders and organizations;
- General public;
- Con Edison customers; and
- Con Edison employees.

Examples of issues identified by stakeholders for the East River Repowering Project that could be anticipated for the new boiler option at the HA Station are:

- Environmental impacts/health effects;

- Existing conditions at the HA Station;
- Regulatory approval process;
- Improvement of the HA Station;
- Impacts on steam and electric rates; and
- Construction related activity

Communication Channels

At the beginning of this process, Con Edison should involve stakeholders representing a cross-section of governmental agencies, communities, and other interested parties. An outreach program generally includes media outreach activities designed to help inform the general public and key stakeholders. Media outreach includes activities such as:

- Press releases issued by Con Edison;
- Newspaper notices in newspapers including *the New York Times, New York Daily News, New York Post, El Diario, Long Island Newsday, Town & Village, Our Town, and World Journal;* and
- Articles published in newspapers and magazines including the New York Daily News, Town & Village, New York Observer, City Limits, Real Estate Weekly, New York Newsday and Bloomberg NewsWire.

Other public outreach materials can be used to distribute Project information such as:

- Project Brochure: provides an overview of the Project and a list of contacts for additional information;
- Poster Stations for Information Exchanges: provides opportunities for interested parties to engage in two-way dialogue with subject matter experts on specific project issues during general public forums and smaller community meetings;
- Project Update Newsletter: provides project information including milestones, notices of upcoming public meetings and follow-up information on issues raised;
- Presentation Materials: includes graphics, charts, and project displays for presentations;
- Project Fliers: provides notice of upcoming public meetings;
- Newspaper Notices: includes project information, notices of filings and public meetings. Notices have included a “tear sheet” which interested parties have used to request additional project information.
- Project Website: The Internet website would be linked to Con Edison’s corporate website and provides general information about the project, copies of press releases, and project documents.
- Electronic Mail: a dedicated e-mail address can be established for the project. Notification of the e-mail address will be made in newspaper notices and through distributed materials such as the project brochure, bill inserts, and updates.
- Telephone: a dedicated local phone number can be established to receive general public input. Notification of these contact numbers will be made in newspaper notices and through distributed materials such as the project brochure, bill inserts, and updates.

These informational materials and communication channels will afford stakeholders access to Con Edison and the opportunity to communicate directly with Con Edison representatives about Project concerns. Additionally, ongoing consultation with community leaders and elected officials will include the receipt of input on improving outreach to community organizations and their constituents.

The fact that the Option 3A project will require SEQRA (CEQRA) approval (refer to section 7.6.1) and that the HA Station is located in a community that will trigger an environmental justice process (refer to section 7.5.2), will dictate a robust public outreach effort.

7.6 Potential Permits and Approvals

Any repowering option may be subject to review by federal (e.g., US Environmental Protection Agency), state (e.g., NYS Department of Environmental Conservation, NYS Department of State), and New York City (e.g., NYC Department of Environmental Protection, NYC Planning Commission) regulators. The extent to which a repowering option will be subject to regulatory review will depend on the net change in emissions, the net environmental impacts/benefit, the improvements at the Station (e.g., upgrade pier area, new stack), and the public perception for issues addressed in the New York City version of the State Environmental Quality Review process. Issues / concerns previously raised by agencies and the community may also influence the permitting approval process. (This discussion assumes that a new power and steam plant licensing process similar to the expired Article X process has not been promulgated when the SEQRA/CEQRA application is submitted.) Under SEQR, all permits needed must be applied for and obtained from the respective state agencies and municipal authorities. Permits / approvals will not be issued until the SEQR approval has been obtained. Refer to Table 7-17 for a preliminary summary of anticipated permits and approvals for Option 3A. A preliminary schedule is displayed Figures 7-21 and 7-22.

The approval process for Option 3A will be the State Environmental Quality Review Act (SEQRA) process as administered by NYC. Refer to Figure 7-23 for a flow chart displaying the SEQR process. Article 8 of the NYS Environmental Conservation Law requires that a proposed major action must undergo a review under the SEQR process for potential environmental impacts. SEQRA requires that state and local governmental agencies assess environmental effects of discretionary actions before undertaking, funding or approving such actions, unless they fall within certain statutory or regulatory exemptions from the requirements for review. This review has been delegated to NYCDEP if the action lies within NYC boundaries, as part of the City Environmental Quality Review (CEQR). CEQR adapts and refines the SEQR rules to take into account the special circumstances of New York City. Some of the primary differences between CEQR and SEQR are that the CEQR process provides guidance on selection of a lead agency, adds scoping requirements, outlines the environmental review responsibilities of the Mayor’s Office of Operations, Office of Environmental Coordination (OEC), and promotes the use of the City's CEQR Technical Manual in conducting environmental reviews.

The Project will require numerous permits and approvals under regulations issued by the City of New York and its agencies (The East River Repowering Project, for example, required more than 30 additional permits/approvals; refer to Chapter 8 of the Article X application). These approvals include building permits, street excavation permits, street closure permits, permits for structural welding, permits for the installation of gas piping, permits under the New York City Fire Code and permits for the use and supply of water. Such permits and approvals will be obtained from the following New York City Agencies: the Department of Buildings, Department of Transportation, Fire Department, Department of Environmental Protection and Department of Business Services. The Air Permit and SPDES permit will be administered by NYSDEC.

Table 7-17
Potential Permits and Approvals *

Agency	Permit/Approval	Agency Action
Federal		
US Army Corps of Engineers	Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)	Permit is required for structures or work in or affecting navigable waters of the US, 33 CFR § 322
United States Environmental Protection Agency (USEPA)	Spill Prevention and Countermeasure Control Plan	Needed for storage of Ultra Low Sulfur Distillate
	Prevention of Significant Deterioration (PSD) permit	40 Code of Federal Regulations (CFR) § 52.21 6 NYCRR 200.12
Federal Aviation Administration	Determination of No Hazard to Air Navigation	Aeronautical study under provisions of 49 U.S.C., Section 44718. For new stack (Option 3A), possibly for construction crane
New York State		
Department of Environmental Conservation (NYSDEC)	State Environmental Quality Review Act	Approval of Environmental Impact Statement – need prior to other state permits, 6 NYCRR § 617
	SPDES Stormwater Permit for Industrial Activities (CWA)	Permit is required for discharge of collected runoff water for construction sites larger than 5 acres; 6 NYCRR Chapter X, Art. 3; Permit for wastewater and process water discharge during operation (boiler blowdown), 6 NYCRR § 751
	Water Quality Certificate	Required for all Federal permits related to water quality; 6 NYCRR § 608.9
	Use and Protection of Waters	Required permit for dredging and construction in State waters. 6 NYCRR §608.7
	Nonattainment New Source Review (NNSR)	Imposes LAER control technology, emission offsets, and requirements on the proposed new project; 6 NYCRR § 231
	Title V Operating Permit (significant modification)	Facility operating permit comprising all required terms and conditions of permits/approvals contained in or issued under the PSD and State Facility Air Permit; 6 NYCRR § 201
	Title IV – Acid Deposition	SO_2 allowance certification under CAAA
	Hazardous Substances Bulk Storage Regulations	6 NYCRR Parts 596 - 599
	Petroleum Storage Permit	6 NYCRR Parts 612-614
State Historic Preservation Office	State Historic Preservation Act	Coordinated with the National Historic Preservation Act; 9 NYCRR § 426
Department of State (NYSDOS) Division of Coastal Resources	Coastal Consistency Determination	Determination of consistency with the designated uses of the coastal zone under state and local plans; 19 NYCRR § 600
Department of Transportation	Highway Access Permit	Modification of transportation routes;

Agency	Permit/Approval	Agency Action
(NYSDOT)		17 NYCRR § 125.2
NYS Public Service Commission	Certificate of Public Need and Necessity (Section 68 of the PSL)	Project developers (if it is an electric corporation as defined in Section 2(13) of the Public Service Law) must also obtain a certificate of public convenience and necessity (CPCN), pursuant to Section 68 of the Public Service Law
	Order for Lightened Regulation and/or Financing approval (Section 69 of PSL)	Financing approval of developer
New York City		
Lead NYC Agency or Commission	City Environmental Quality Review (CEQR)	CEQR is New York City's process for implementing SEQRA, environmental impact review
NYC Department of Environmental Protection (NYCDEP)	Permit required for temporary connections to the sewer system for construction operations	15 RCNY §§18-37; 19-08.
	Groundwater discharge permit required to discharge over 10,000 gallons per day (gpd) of groundwater into a public sewer	15 RCNY § 19-02(f).
	Permit for use and supply of water	15 RCNY §§ 20-02 - 05, 07, 09; Admin. Code § 24-404.
	Permit required to use, operate or tamper with a fire hydrant, high pressure hydrant, or valve in the City water supply system	15 RCNY 20; Admin. Code §§ 24-308, 309, 310.
	Certificate of operation for Fuel Burning Equipment	15 RCNY §§ 2-01, 03, 06.
	Permit for noise control related to tunneling (gas pipeline within Station property)	15 RCNY § 7-01; Admin. Code §§ 24-245©-(e), 246-250.
NYC Department of City Planning	Waterfront Revitalization Program	Authorized by State and Federal Coastal Management Programs. Consistency determination with NYC coastal management program and policies (NYS Department of State must ultimately certify consistency)

* Dependent on the design of the Option 3A project and the final plan for construction related activities.

Figure 7-21 Preliminary Schedule for Obtaining Permits and Approvals – SEQR / CEQR

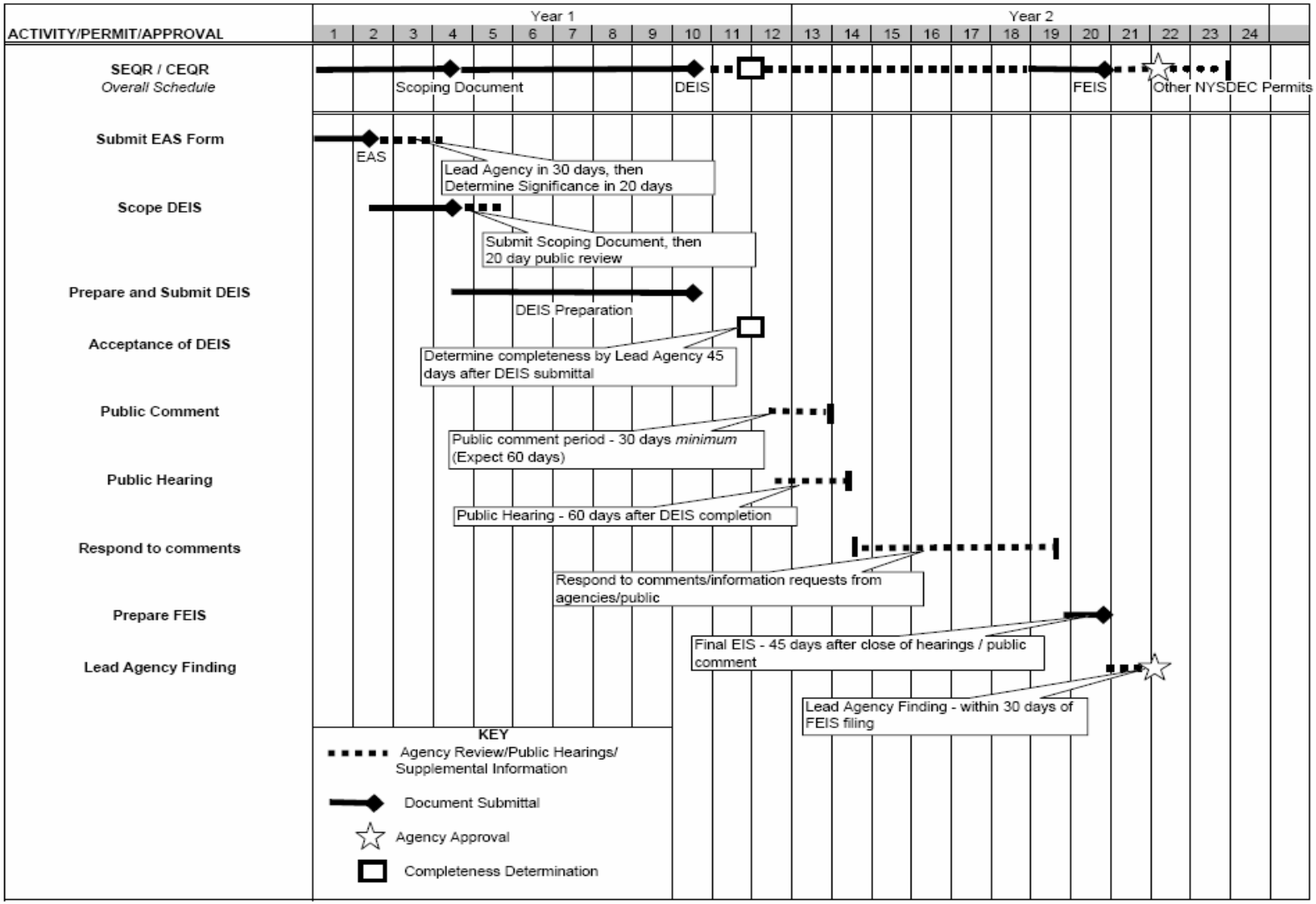
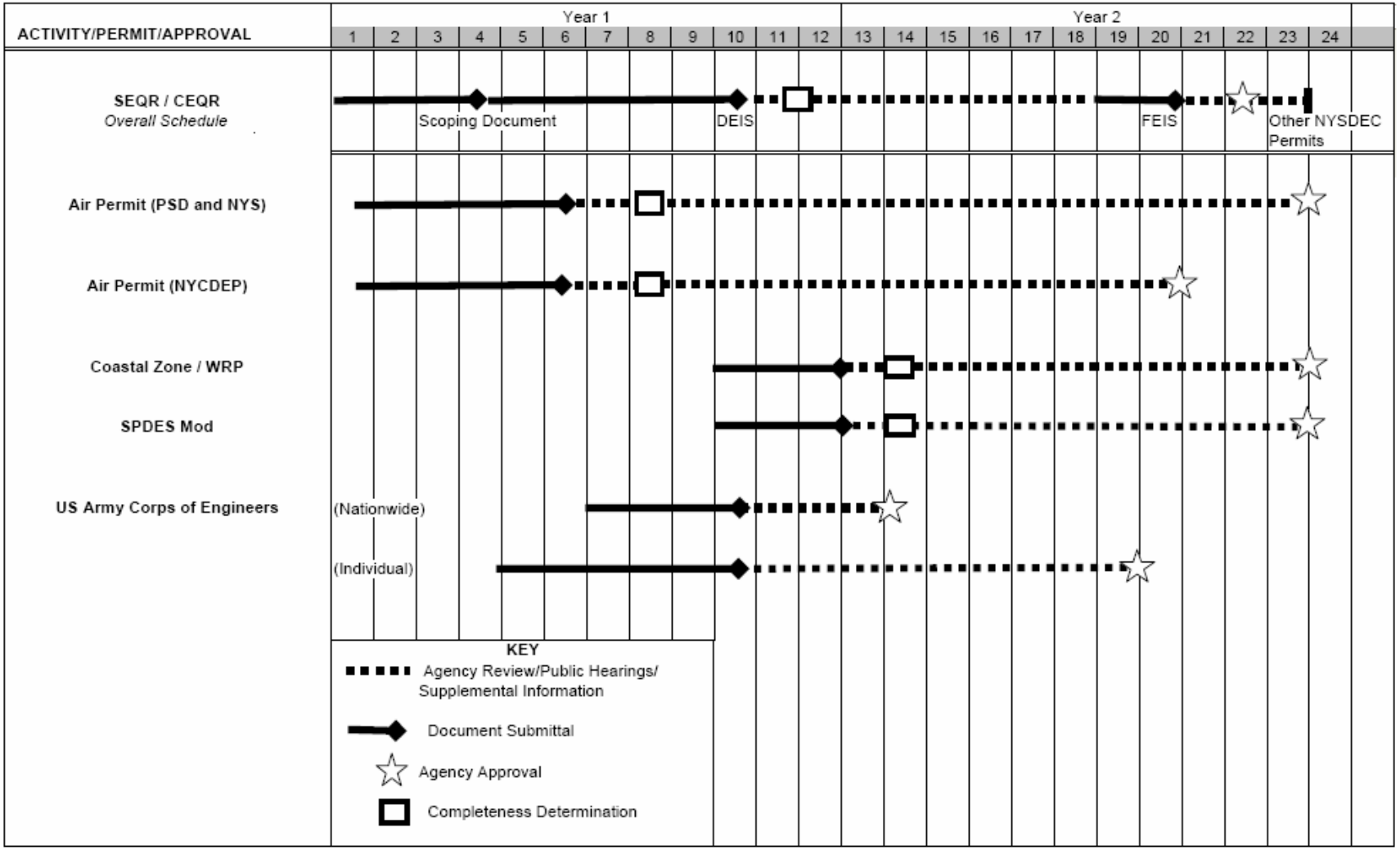
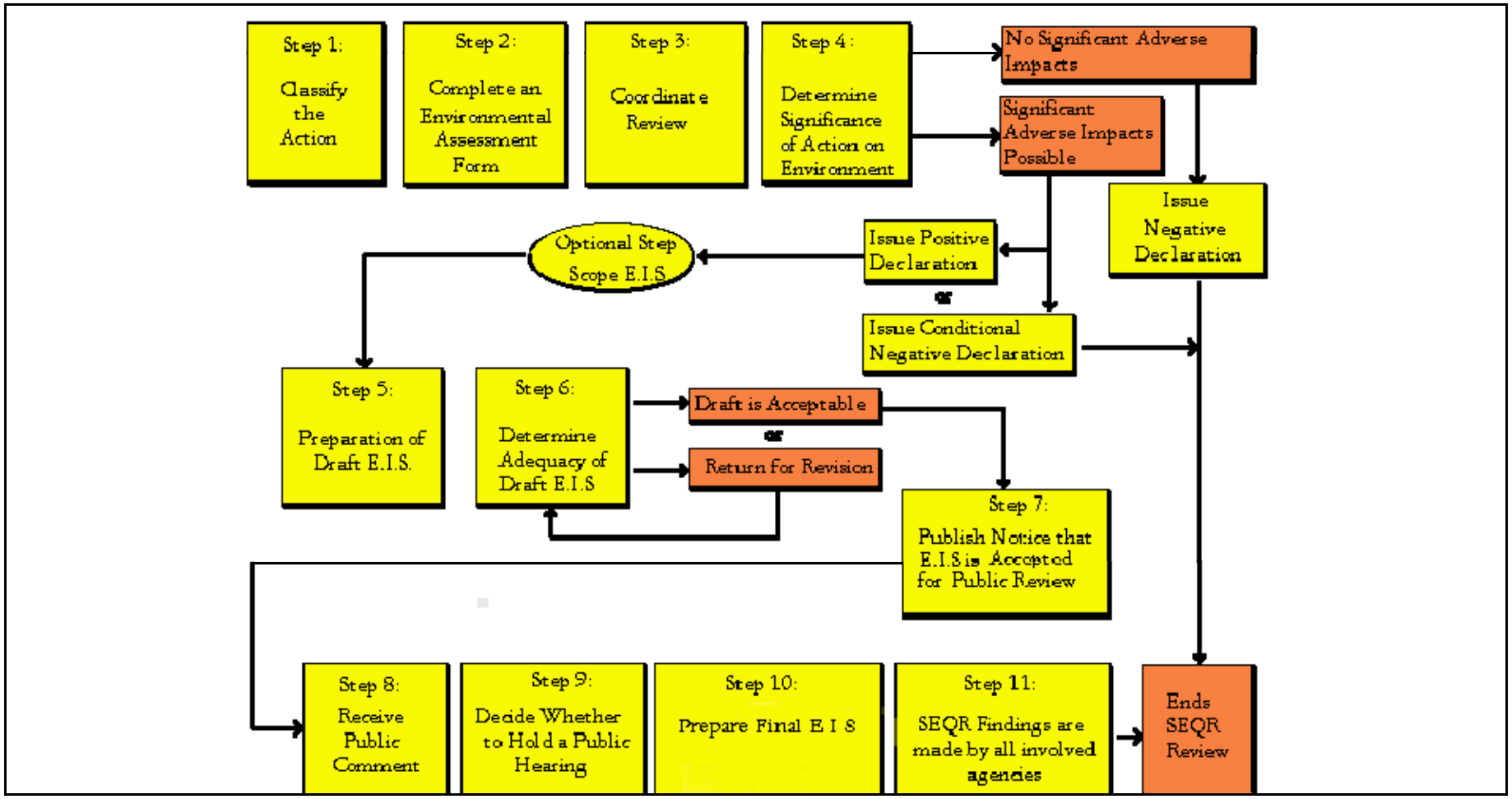


Figure 7-22 Preliminary Schedule for Obtaining Permits and Approvals – Other Federal and NYS




Step 1: Classify the Action
Step 2: Complete an Environmental Assessment Form
Step 3: Coordinate Review
Step 4: Determine Significance of Action on Environment
No Significant Adverse Impacts
Significant Adverse Impacts Possible
Issue Negative Declaration
Issue Positive Declaration
Optional Step Scope E.I.S.
or
Issue Conditional Negative Declaration
Step 5: Preparation of Draft E.I.S.
Step 6: Determine Adequacy of Draft E.I.S
Draft is Acceptable
or
Return for Revision
Step 7: Publish Notice that E.I.S is Accepted for Public Review
Step 8: Receive Public Comment
Step 9: Decide Whether to Hold a Public Hearing
Step 10: Prepare Final E I S
Step 11: SEQR Findings are made by all involved agencies
Ends SEQR Review

7.6.1 City Environmental Quality Review (CEQR)

The CEQR process will likely apply to any new major project in NYC. The first step in this process is completion of an Environmental Assessment Statement (EAS) form, Part I and Part II, which is submitted to the NYC Lead Agency for review and determination of significance. The NYCDEP or the NYC Planning Commission will likely be the lead agency for the project consisting of new boilers. The lead agency will determine if the proposed project will have a significant adverse environmental effect, and will be responsible for coordinating the review of the EAS and other documents. If the applicant can successfully demonstrate that there are no significant environmental impacts, a negative declaration or a conditional negative declaration with suggested project changes to mitigate the impacts is a possibility. Alternatively, a positive declaration may be issued identifying one or more adverse impacts, thus triggering an environmental impact statement (EIS). The projects/actions are categorized as either Type I, Type II or Unlisted. The Option 3A project is likely a Type I action and it is presumed that the project is likely to be determined have a potential adverse environmental impact.

Although Option 3A may be classified as a Type I action that requires a full review under CEQR, arguments may be advanced that could result in the issuance of a negative declaration. Since the repowering is proposed at an existing power plant site, it may be possible to demonstrate that the impacts associated with the project are not significant or are less than the current impacts experienced through operating the existing LP Boilers, and that an EIS need not be prepared to complete the CEQR process. In this scenario, a long EAS form would be prepared for review by the agencies, and the EAS form submittal would be supplemented with an Environmental Assessment (EA) to document the potential impacts, and how those impacts would be reduced or mitigated. Negative declarations have been obtained in this manner for New York Power Authority and Long Island Power Authority gas turbine peaker projects as well as numerous combined-cycle power projects approved by the Long Island Power Authority since 2000. The potential for a negative declaration will likely be influenced by the reaction of politicians and the community during the early phase of public outreach.

If a negative declaration is not feasible, then a draft Scoping Document identifying all technical areas to be addressed in the DEIS should be submitted to the lead agency. Within 15 days of the issuance of a positive declaration, the lead agency must issue a draft scope of work which details the topics to be addressed in the EIS, the methods of analysis to be used, and possible alternatives to mitigate or eliminate potential significant impacts of the proposed action. The Scoping Document describes the proposed action in sufficient detail to ensure clear understanding of the key technical issues that have a potential adverse environmental effect on the environment and to identify any studies to be conducted. The Scoping Document must also provide the rationale for not including issues that are considered to be insignificant.

The following is a preliminary list of technical areas that are identified in the CEQR Technical Manual that may need to be addressed in the draft Scoping Document for the Option 3A repowering scenario:

- Land use, zoning, and public policy,
- Socioeconomic conditions and community facilities/services,
- Historic resources,
- Urban design and visual resources,
- Neighborhood character,
- Hazardous materials,
- Waterfront revitalization program,
- Infrastructure,

- Solid waste and sanitation services,
- Energy,
- Traffic and parking,
- Air quality,
- Noise,
- Construction impacts,
- Public Health, and
- Alternatives (e.g., sites, equipment type and size).

The ultimate decision as to whether an issue needs to be addressed for significant impacts will reside with the lead agency, likely either the NYCDEP or New York City Department of City Planning staff. Upon receipt of the Scoping Document, the lead agency will conduct the public scoping meetings to specify the issues that should be addressed in the DEIS. Comments at these meetings must be limited to the scope of work for the EIS and any changes needed to ensure appropriate and thorough assessment of potential impacts. The meeting must be scheduled 30 to 45 days after notice is given and the draft scoping summary and EAS form are circulated to all affected and interested agencies, community boards, groups and officials. Written comments may be received within ten days after the public meeting. After incorporating public comments as appropriate, the lead agency issues a final scope of work and preparation of the DEIS commences.

After the approval of the study effort outlined in the Scoping Document, a DEIS will be prepared and submitted to the lead agency. The DEIS must address the issues determined to be significant in the following context: identification and discussion of environmental impacts and mitigation measures proposed to minimize or mitigate impacts. In addition, alternatives to the proposed action raising the concern should be considered as well. The DEIS is subject to public review and comment. Generally, the lead agency must conduct a public hearing on the DEIS within 15 to 60 days of its completion.

After the DEIS is accepted (modification based on agency/public input is likely), a final EIS addressing the agency and public comments will be produced. Many of the technical issues and the evaluation techniques required by the NYCDEP for these issues are presented in the CEQR Technical Manual.

Some unique issues that need to be addressed under CEQR include:

- An air quality dispersion modeling analysis specific to the area surrounding the HA Station (out to approximately 1000 ft) that includes the development of a source inventory for combustion equipment >2.8 MMBtu/hr heat input. (Chapter 3, section Q312 of the NYCDEP's CEQR Technical Manual dated October 2001).
- An assessment that the project is consistent with Land Use/Neighborhood Character surrounding the HA Station should be demonstrated. The installation of the project within an existing site will decrease this concern.
- New York City's zoning resolution for the Heavy Manufacturing district stipulates (Section 42-283) that "[when] an M3 district adjoins any other district, any activity producing excessive humidity in the form of steam or moist air . . .shall be carried out in such a manner as to not be perceptible at or beyond the district boundary." The HA Station adjoins other zoning districts, and may emit a water vapor plume from the stack that would be detectable beyond the M3 district boundary line. The condensed water plume

results from the release of water vapor contained in the fuel formed as a product of combustion.

- Proposed actions that are situated within the boundaries of New York City's Coastal Zone must be assessed for their consistency with the City's Local Waterfront Revitalization Program (LWRP). The LWRP established the City's Coastal Zone and included a set of 56 policy statements (44 State policies and 12 City policies) that address the waterfront's important natural, recreational, industrial, commercial, ecological, cultural, aesthetic and energy resources. The New York City Department of City Planning on September 8, 1999 presented the Waterfront Revitalization Program (WRP), a Proposed 197a Plan as an update of the City's original revitalization program, adopted in 1982. This new plan recognized community-based plans, adopted by the City Planning Commission and City Council including the Comprehensive Manhattan Waterfront Plan (1997). The New WRP replaced the previous 56 City and State policies with 10 policies and identified two types of special coastal areas: Significant Maritime and Industrial Areas (SMIAs) and Special Natural Waterfront Areas (SNWAs).

The Article X regulatory process in NYS that governed the environmental approval process for power plants of 80 MW or greater output sunset in January 2003. Since that time several bills to reinstate Article X have been introduced into the NYS Assembly and Senate without any success. In May 2007, Governor Spitzer's office issued a draft reauthorization bill for comment to various entities in the generation business and interested parties. The Governor's initiative has been introduced as a bill in the Senate and will likely establish rules for new and repowered electrical generation and generating facilities that supply steam to a distribution system in NYS. The lack of an Article X reauthorization since 2003 has been caused by the differing versions of the bills being advanced by the Assembly and Senate. At this time, it cannot be discerned when a reauthorization bill will be passed and approved, nor can the content of such a bill that could affect the Option 3A new boiler project be ascertained. The potential for a reauthorization of an Article X type bill that would affect the Option 3A new steam boiler project should be monitored closely.

7.6.2 NYC Waterfront Revitalization Program

The New York City Waterfront Revitalization Program (WRP) is the city's principal coastal zone management tool. As originally adopted in 1982 and revised in 1999, it establishes the city's policies for development and use of the waterfront and provides the framework for evaluating the consistency of all discretionary actions in the coastal zone with those policies. When a proposed project is located within the coastal zone and it requires a local, state, or federal discretionary action, a determination of the project's consistency with the policies and intent of the WRP must be made before the project can move forward.

Local discretionary actions, including those subject to land use (ULURP), environmental (CEQR) and Board of Standards and Appeals (BSA) review procedures, are reviewed for consistency with the WRP policies. WRP review of local actions is coordinated with existing regulatory processes and in most instances occurs concurrently. For local actions requiring approval by the City Planning Commission, the Commission acting as the City Coastal Commission makes the consistency determination. For local actions that do not require approval by the City Planning Commission but do require approval by another city agency, the head of that agency makes the final consistency determination. For federal and state actions within the city's coastal zone, such as dredging permits, the Department of City Planning, acting on behalf of the City Coastal Commission, forwards its comments to the state agency making the consistency determination.

Applications for action within the City's Coastal Zone generally require the submission of a NYC WRP Consistency Assessment form. If the Project requires the preparation of an Environmental Assessment or EIS, the WRP consistency assessment will be incorporated in the Environmental

Assessment or EIS. Applications requiring joint NYSDEC and USACE approval should also include the NYC Consistency Assessment Form and supporting information to address relevant WRP policies.

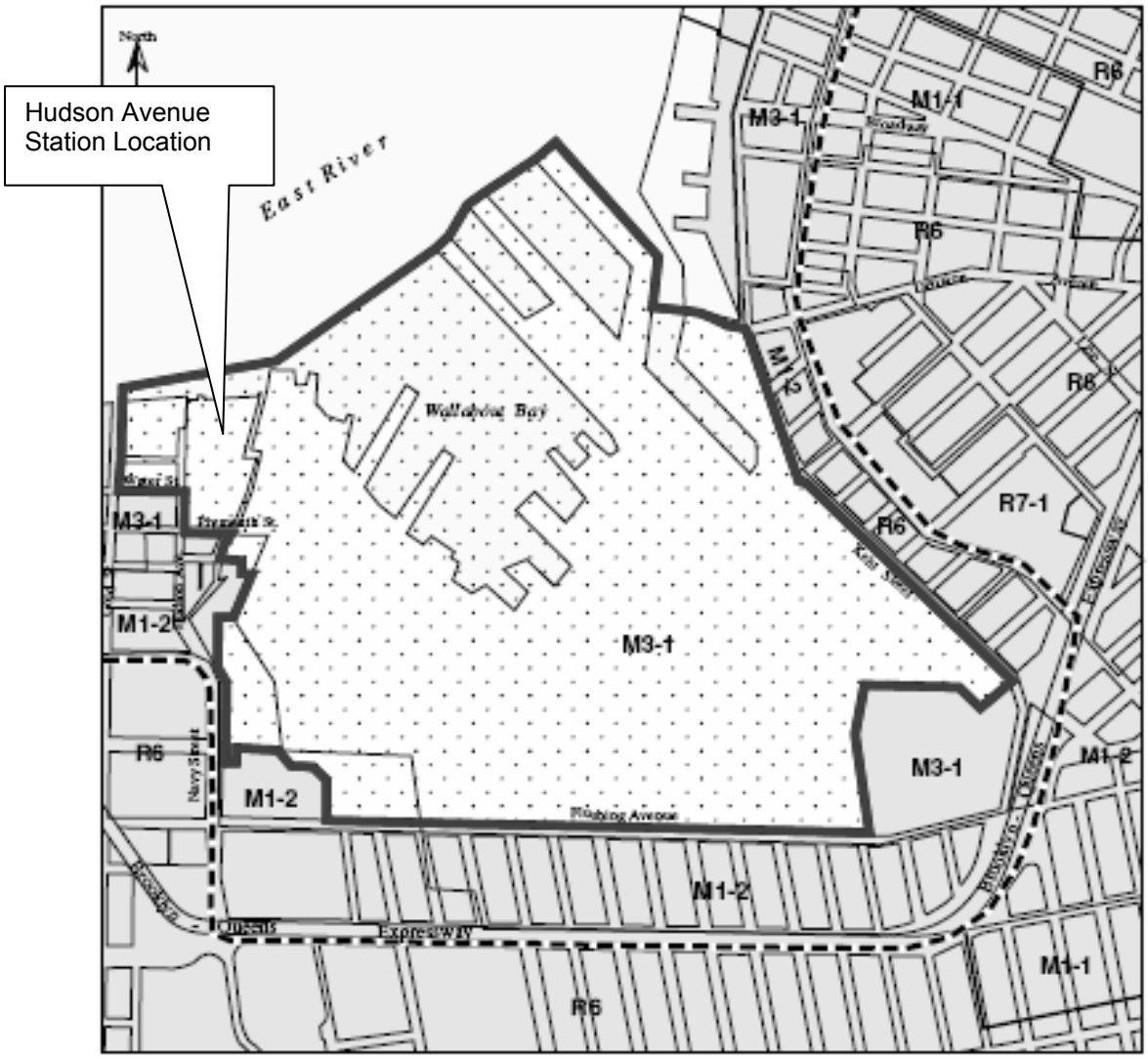
A proposed action or project may be deemed consistent with the WRP when it would not substantially hinder and, where practicable, will advance one or more of the ten WRP policies, dealing with: (1) residential and commercial redevelopment; (2) water-dependent and industrial uses; (3) commercial and recreational boating; (4) coastal ecological systems; (5) water quality; (6) flooding and erosion; (7) solid waste and hazardous substances; (8) public access; (9) scenic resources; and (10) historical and cultural resources.

The HA Station is located within the Brooklyn Navy Yard "Significant Maritime and Industrial Area" (SMIA), as displayed on Figure 7-24. As described under Policy 2 of the WRP, these areas are particularly well-suited for maritime and industrial development. According to the WRP, waterfront activity that furthers the industrial or maritime character of these areas would be consistent with coastal policies for these properties. Policy 2 states, "within the SMIAs, activities which support industrial or maritime activity are consistent with this policy. If an activity satisfies the criteria contained in standard 2.1 of this policy, then it is consistent with the City's goals for these areas and need not be subject to further review." Relevant conditions listed in Section 2.1 are A, E, and especially B:

2.1 Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas (excerpts)

> A. Promote the development and operation of working waterfront uses, and measures that support these uses such as dredging for navigation and maintenance purposes. Actions that would inhibit the efficient operation of the SMIAs as industrial or maritime areas should be avoided.
>
> B. Maintain sufficient manufacturing zoning in SMIAs to permit heavy industrial uses essential to the city's economy and the operation of utilities, energy facilities and city services.
>
> E. Preserve or improve existing shorefront infrastructure, including bulkheads, wharves, and piers, to permit simultaneous or subsequent water-dependent activity and to promote flood and erosion control.

The fact that there is existing steam generating equipment at the HA Station, that the proposed Option 3A new boilers would replace the older LP Boilers, that Boiler 100 resides in an existing Annex building, and that the project furthers the objectives of the Brooklyn Navy Yard SMIA lessens the likelihood of a significant issue interfering with Waterfront Development approval. The Waterfront Development approval is important, since the residential and commercial redevelopment of the Greenpoint and Williamsburg waterfronts pursuant to the City's Land Use and Waterfront Plan led to a negative recommendation by the hearing examiner in the case of the TransGas Energy Systems 1,100 MW project in Brooklyn. The repowering of the HA Station has a different set of circumstances than the TransGas project with respect to the City's Waterfront Revitalization Plan.



	Consolidated Edison Company of New York, Inc. July 2007	**Brooklyn Navy Yard SMIA** Source: NYC Department of City Planning, Waterfront Revitalization Program	Figure 7-24 www.ensr.aecom.com

7.6.3 Other Permits and Approvals

Since Option 3A results in a change in the quantity of water and the constituents in the water discharged to the East River, a State Pollutant Discharge Elimination System (SPDES) permit modification will be needed. A water allocation permit from NYCDEP is required, since City water will be utilized for steam generation the Boiler 100 and new boiler plant processes. No increase in Station water withdrawal from the East River will occur. Refer to section 7.5.4 for a discussion on the SPDES permit.

The need for other permits / approvals listed such as the US Army Corps of Engineers (USACE), Coast Guard, NYC Department of Buildings, NYCDEP, and NYC Fire Department will be determined. Note that the complexity of any Corps permit (nationwide or individual) will be dependent on any planned improvement of shoreline structures (e.g., piers, bulkheads, unloading platforms, intake structures). CEQR guidance issued by NYCDEP will be followed; although, this agency may defer to the City Planning Commission as the lead agency under CEQR. NYC Department of Buildings and Fire Departments will issue approvals for the demolition of structures and the construction of new structures as well as the gas interconnect and possibly for aqueous ammonia storage onsite. The NYC Buildings and Fire Department approvals / permits obtained for the East River Repowering Project would likely be needed for the Option 3A project.

7.6.3.1 Army Corps of Engineers

Due to the limited access to the HA Station through residential neighborhoods and narrow streets, the delivery of major equipment will likely occur through East River access (e.g., barge delivery). Associated with pier offloading, the pier, bulkhead, and/or mooring structures may need to be rehabilitated or reinforced. Any person, firm, or agency planning to work in navigable waters of the United States, or discharge (dump, place, deposit) dredged or fill material in waters of the United States, including wetlands, must first obtain a permit from the USACE. According to the USACE, three to four months is normally required to process a routine application involving a public notice; for a large or complex activity the duration will be longer. A "pre-application consultation" or informal meeting with the Corps during the early planning phase of the project is recommended.

The USACE in connection with the review of applications for Department of the Army (DA) permits to authorize certain structures or work in or affecting navigable waters of the United States pursuant to section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) (hereinafter referred to as section 10). In this regulation, the term "structure" includes any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction. A “nationwide permit” (or “general permit”) may be issued when the proposed activities are “substantially similar in nature and cause only minimal individual and cumulative environmental impacts”. If an activity is not authorized by a nationwide permit, then an individual Section 10 permit will be required for the proposed shoreline activity.

Nationwide permits (NWPs) are a type of general permit issued by the Chief of Engineers and are designed to regulate with little, if any, delay or paperwork certain activities having minimal impacts. Proposed NWPs or modifications to or reissuance of existing NWPs will be adopted only after the Corps gives notice and allows the public an opportunity to comment on and request a public hearing regarding the proposals. An activity is authorized under an NWP only if that activity and the permittee satisfy all of the NWP's terms and conditions. Activities that do not qualify for authorization under an NWP still may be authorized by an individual or regional general permit.

7.8 Summary

A summary of the findings for the preliminary environmental permitting investigation of the Option 3A Boiler 100 upgrade and two new package boilers is as follows:

1. ***[REDACTED]***

2. The fuels selected for Option 3A are natural gas and LSD or ULSD. The LSD or ULSD will likely be limited to 720 hours per year and may be confined to the winter months (December, January and February). LSD has a sulfur content of 0.047% S and ULSD has a sulfur content of 0.0015% S.

3. ***[REDACTED]***

4. ***[REDACTED]***

5. The existing 356 ft. stack at the Annex boilerhouse would exhaust all Option 3A boilers. The stack height is less than the Good Engineering Practice height.

6. ***[REDACTED]***

7. Assuming a restricted annual operating limit at full load of***[REDACTED]*** hours for Boiler 100 / two new package boilers, and the netting with LP Boiler emissions for the average of the ***[REDACTED]*** emission statements, the net emissions exceed the PSD threshold for PM10. For unrestricted annual operation, CO and PM10 for PSD and PM2.5 (LSD and ULSD) and VOC for NNSR may exceed the applicable thresholds.

8. ***[REDACTED]***

9. There is significant development within 2 kilometers of the HA Station that has resulted in the proliferation of high rise residential and commercial buildings. These buildings include newly constructed, under construction and planned. Impacts caused by emissions from the new boilers at any ambient air receptor locations on buildings within 2 kilometers must be modeled in accordance with NYSDEC guidance. Buildings that are constructed and inhabited prior to an air permit issuance by NYSDEC may need to be included in the modeling.

10. The HA Station is located within an Environmental Justice community as defined by an area encompassed by a 1-mile radius from the center of the site. This will trigger some additional evaluations and an enhanced public outreach program.

11. Based on the limited noise design information available, the preliminary noise evaluation predicted sound levels to exceed the applicable 45-dBA limit at the closest residential areas. The dump condenser is the noise source that requires an engineering design modification or noise mitigation to meet the NYC noise code.

12. The Option 3A Boiler 100 upgrade / new boiler project would likely be considered a significant project under the SEQR process as administered by NYC (CEQR). As such, an Environmental Impact Statement would be required along with all the intermediate steps discussed in section 7.6.

13. No additional water withdrawal from the East River is anticipated, however, the potential for a change in City water allocation will need to be determined.

14. Disposal costs for soil excavated in association with the new boilerhouse range from ***[REDACTED]*** to ***[REDACTED]*** depending on the soil classification (hazardous or non-hazardous) and quantity removed.

15. A USACE permit may be needed if any repair, replacement or reinforcement of the pier / bulkhead is needed to deliver project components to the site. Whether a NWP or individual permit is needed will be determined when the details of any shoreline improvements are available.

16. Modifications of the HA Station Title V air permit and SPDES permit for the HA Station will be required.

17. The total timeframe estimated from initiation of the permitting effort to the issuance of all permits / approvals needed for construction is approximately 24 months.

18. The following items that require discussion with NYSDEC prior to the Option 3A moving forward are:

    - ***[REDACTED]***

- ***[REDACTED]***

7.8 References

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http://www.dec.state.ny.us/website/ej/ppp.html

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US Environmental Protection Agency, Region 2, Interim Environmental Justice Policy, December 2000. http://www.epa.gov/region2/ej/

Worley Parsons. Long Term Con Edison Steam Production Options Study- Phase 1. Report No. 53780001-CED-FR-01. Prepared for Consolidated Edison Company of New York, Inc in conjunction with the Steam Business Development Core Task Force, October 2006.

8.0 OPERATING & MAINTENANCE (O&M) COSTS

8.1 Overview

PB Power has performed the cost estimates and analysis of the projected annual operating and maintenance cost (O&M) for Option 3A based on the staffing level and potential annual fixed O&M costs provided by Con Edison. The fixed O&M cost from Con Edison were evaluated and included to the variable O&M costs estimated by PB Power. While the cost of fuel is the major component of operation cost, the fuel cost has not been included in the annual O&M cost presentation.

Discussions with key plant personnel and observation of the operating L.P. boilers and the condition of the retired Unit 10/100 have indicated the availability of qualified and experienced operating and maintenance personnel to operate the new boiler plant. Despite the degradation and various issues of the existing L.P. boilers associated with their age, the plant personnel have successfully operate the units close to their original design efficiency. Several inspections of the retired Annex Unit (Unit 10/100) have indicated that the facility is generally well kept, clean and neat despite being retired for three years. These are good indications of the presence of pride in workmanship in plant housekeeping. The attitudes of several plant personnel interviewed by PB Power were generally positive.

8.2 Assumptions

The following assumptions were used for estimating the Option 3A annual O&M cost estimate:

- The material components of the annual O&M costs were escalated ***[REDACTED*** annually to reflect year 2009 prices.
- The labor costs components O&M costs were escalated ***[REDACTED*** annually to reflect year 2009 costs. The estimated labor expenses provided by Con Edison are assumed to include all labor related costs including insurance and benefits.
- Maintenance and periodic overhaul includes annual accrual for periodic SCR replacement and boiler maintenance.
- Plant Operation 2009
- Equivalent Full Load Operation (Gas) ***[REDACTED]***
- Equivalent Full Load Operation (Oil) ***[REDACTED]***
- Total Equivalent Full Load Operation ***[REDACTED]***
- Fuel Gas Price $ 8.00/decatherm
- No. 2 Oil Price $ 2.60/gallon
- Electricity Cost $ 0.12/kWhr
- Raw Water Unit Cost $ 2.25/kgal
- Demineralized Water Unit Cost $ 3.63/kgal
- Liquid Urea Unit Cost $ 1.50/gal

8.3 Non-Fuel Annual O&M Costs

The estimated total annual non-fuel operation and maintenance cost of the package boiler plant is estimated to be ***[REDACTED]*** ((2009 dollars) or approximately ***[REDACTED]*** /lb/hr of steam send out at total equivalent full load operation of ***[REDACTED***.

The fixed annual O&M cost provided by Con Edison based on total of ***[REDACTED]*** O&M personnel constitutes the majority of the estimated annual expenses of ***[REDACTED]*** (2009 dollars) or approximately ***[REDACTED]*** of the total O&M cost. The variable non-fuel mainly includes material, lubricants, water, electricity, chemicals and other consumables. The variable non-fuel O&M costs is estimated to be ***[REDACTED]*** million (2009 dollars) or approximately ***[REDACTED]*** of the total annual O&M expenses.

The variable O&M cost estimates are developed based on information provided by different equipment vendors (i.e. SCR/CO catalysts system, water treatment system, etc.) in house cost database from other comparably sized projects and previous experience. The costs have been adjusted to reflect New York City conditions.

Table 8-1 below summarizes the estimated annual O&M cost of the package boiler plant.

Table 8-1 Estimated Annual Operating & Maintenance Cost for Option 3A

O&M DESCRIPTION	2007($)	2008 ($)	2009 ($)
Estimated Annual Fixed O&M Cost [1]			

Notes:

1 - Fixed O&M cost is based on information provided by Con Edison (*[REDACTED]* total O&M personnel).
2 - Includes annual accrual for periodic SCR replacement and boiler maintenance.
3 - Based on information provided by different equipment vendors and from in house cost database.

8.4 Con Edison Fixed O&M Costs

PB Power has utilized the following fixed O&M costs provided by Con Edison for estimating the total annual O&M costs of the package boiler plant. The Con Ed total annual labor cost is based on estimated total 65 OPS and MTCE labor personnel.

- Total Annual Labor Cost *[REDACTED]*
- Maintenance/Periodic Overhaul *[REDACTED]*
- Misc. Fixed O&M Costs *[REDACTED]*
- Annual Total Fixed O&M Cost *[REDACTED]*

8.5 20 Year O&M Cost Projection

The variable cost components of the O&M cost estimates are developed based on information provided by different equipment vendors (i.e. SCR/CO catalysts system, water treatment system, etc.) in house cost database from other comparably sized projects. The costs have been adjusted to reflect New York City conditions. Tables 8-2 summarize the 20-Year O&M projections for Option 3A.

9.0 PROJECT SCHEDULE

The preliminary project schedule is based upon on turnkey Engineering Procurement and Construction approach. Based on comparable type and size projects in various brown field areas, the proposed upgrade of Unit 10/100 with addition of package boilers is expected to be completed and commissioned in approximately forty-eight to fifty-four (48-54) months from permit application. PB Power has developed a preliminary project schedule as illustrated in Figure 9-1. The critical path for the schedule will be the long lead items including the SCR/CO catalyst systems and package boilers with estimated delivery of approximately 10 to 12 months. The following is a summary of anticipated activities during the project implementation program for the proposed upgrade of Annex Unit.

9.1 Permitting Phase

If the proposed plan were considered to be a Significant Permit Modification (e.g. introduction of a piece of equipment that would result in significantly higher emission rates), the duration for permitting process would be similar to that required for a new facility. Depending on the degree of public involvement, control efficiencies, the need for dispersion modeling and agency workload, it is expected that a permit would be issued in approximately twenty four (24) months.

9.2 Engineering Phase

The total engineering phase of the project is expected to cover a period of between twelve to sixteen (12-16) months during which all engineering activities would be covered.

The engineering phase of the project will involve preparation of design documents, sizing of equipment, detail drawings and specifications, and other supporting activities to the degree of detail required to fully and clearly define manufacturing and construction work requirements and minimizes design engineering work in the field. The engineering activity will include all mechanical, electrical, instrument and control, civil and structural construction drawings for the plant and supporting systems. The following design documents are expected to be generated during the engineering design phase of the project:

- Process and Instrument Diagrams (P&IDs)
- Arrangement drawings
- Purchase and construction specifications
- Structural drawings
- Civil/architectural drawings
- Foundation design
- Equipment arrangement
- Piping layouts
- Pipe stress analysis
- Electrical drawings
- Instrumentation diagrams, control loops, etc.

The engineering phase of the project is expected to include the following activities:

- Site survey to identify interferences and items to be removed or relocated from the site which include the following:
  - Miscellaneous equipment
  - Geotech exploratory drilling and study
- Conduct survey to identify tie-in locations for:
  - Steam system
  - Fuel gas supply

Fuel oil supply
Feed water supply pipe work interconnection with existing system
Compressed air supply pipe work and interconnection with existing system
Fire protection pipe work and interconnection with existing system
Potable water supply and service water pipe work and interconnection with existing
Waste water pipe work and interconnection with existing
Electrical
Instrumentation and control

9.3 Procurement Phase

Procurement will immediately follow the engineering design activities. The procurement process will include bid solicitations and evaluations, negotiations with the vendors, assessment of any revisions or amendments made to their proposals, dealing with bid clarifications, contract award and notice to proceed. It is estimated that procurement activities will be completed in approximately twelve to eighteen (12 - 18) months to actual equipment delivery.

9.4 Construction Phase

The modification, restoration of existing Unit 10/100, construction, field erection of SCR/CO system and package boilers, air cooled dump condenser is estimated to be sixteen to twenty (16-20) months following completion of site mobilization. The construction phase will include the following activities:

- Site mobilization and preparation
- Foundation and structural support construction
- Unit 100 boiler restoration and medication including burner conversion
- Unit 10 steam turbine and valve work restoration and modification
- Installation and field erection SCR/CO system, air cooled dump condenser and package boilers
- Installation of all auxiliary mechanical equipment, electrical, instrumentation, etc.
- System tie-ins

9.5 Commissioning and Startup Phase

The testing, start-up and commissioning activities of the proposed Unit 10/100 cogeneration facility are expected to be completed within three to four (3-4) month period subsequent to completion of construction phase.

APPENDICES

I. Detail Budget Estimates
II. Engineering Drawings
III. Vendor Information
IV. References
V. Glossary

APPENDIX I

DETAILED BUDGET COST ESTIMATES

[REDACTED]

APPENDIX II
ENGINEERING DRAWINGS

[REDACTED]

APPENDIX III

VENDOR INFORMATION

[REDACTED]

APPENDIX IV
REFERENCES

APPENDIX V
GLOSSARY

APPENDIX I – DETAILED COST ESTIMATES

APPENDIX I

DETAILED COST ESTIMATES

UPGRADE OF EXISTING ANNEX UNIT

REDACTED

APPENDIX I

DETAILED COST ESTIMATES

TWO (2) X 250,000 LB/HR PACKAGE BOILERS

[REDACTED]

APPENDIX IV – REFERENCES

The following documents were reviewed and used as a reference in the Hudson Avenue Investment Grade Cost Study.

Reports/Studies

- Worley Parsons Phase 1 Final Report (October 2006)
- Unit 10/100 SCR Phase 1 Feasibility Study (February 2004)
- Unit 10/100 SCR Phase 2 Cost Estimate Study (March 2004)
- B&W Engineering Study of Natural Gas Conversion of Boiler 100 (May 1989)
- B&W Boiler 100 Inspection Report (September 2004)
- Unit 10/100 125V DC System Condition Assessment (April 2004)
- Unit 10/100 Battery Condition Report (April 2004)
- LP Boilers and Annex Fuel Oil System Condition Assessment (April 2004)
- Industrial Hygiene Assessment Report by Clayton (October 2004)
- Hudson Avenue Station Water Softening Condition Assessment (April 2004)
- Hudson Avenue Station Water Treatment Condition Assessment (July 2005)
- Stack Inspection Report (July 2002)
- Summary of Investigation and Remedial Plan -Soil Report (March 2006)

Miscellaneous Information

- 2001 Emission Statements
- 2002 Emission Statements
- 2003 Emission Statements
- 2004 Emission Statements
- 2005 Emission Statements
- Turbine #10 Original Specifications
- Boiler and Turbine Data Sheets
- Retired Plant Control Systems Description -Hudson Avenue Unit 10/100
- General Information on Remediation Issues
- Hudson Avenue Station Electric Interconnection Demarcation (December 2006)
- Unit 10/100 Investigation Chronology of Events
- LP Boilers and Annex Fuel Farm Diagrams
- Unit10/100 Heat Balance
- Hudson Avenue Station Simplified Piping Diagram
- One Line Diagram Tracking List
- Steam Send out Statistic and Boiler Efficiency
- Hudson Avenue Station Transformer Inventory
- Hudson Avenue Station Breaker 10 Description
- Con-Ed Engineering Instructions

Con Edison Drawings

- 118578-13 City water header in basement, HP Boiler #100 and unit #10 Annex
- 325615-00 Compiled floor plans, Cushman-wakefield study, List of drawings
- 315540-10 Simplified piping diagram for steam sendout
- 121364-0 HP unit #10 fuel oil system
- 120476-1 Fresh water fooling water piping for hydrogen coolers HP Turbine #10
- 118594-4 Extraction steam piping high pressure turbine #10
- 120335-5 Electrical equipment on operating floor

- 119170-5 Floor framing around turbo generator #10
- A124639-0 Plans sections and details of floor drainage over control room HP Boiler #100
- 120505-1 Boiler & equipment boiler drum and ventilating fan level elevation 252' boiler #100
- 120501-3 Boiler & equipment basement and operating floor electaion 123' boiler #100
- 119158-3 Foundations for transformer lighting and power switch equipment unit no. 10 plan and sections
- 175520-9 Arrangement of fuel oil piping for two 17MW gas turbine generators sheet #1
- A232616-1 Sewage system revision plan of equipment and piping arrangement
- 118231-0 General plan view of service water and basement
- 121232-4 Steam and water wash piping for boiler feed pump turbine and high pressure turbine #10 and steam for turbine driven auxiliary oil pumps unit #10
- 122057-1 Arrangement of piping for main steam, boiler feed water and air flow recorder and main stream pressure, boiler feed pressure and drum level recorders. HP Boiler #100
- A120498-8 Heater Drain piping from drip condenser high pressure Unit #10
- 101060-3 Elect. Galleries extension drainage plan and section
- A119155-4 Sections through foundations boiler #100 - turbine #10 sheet 4 of 4
- A119155-3 Sections through foundations boiler #100 - turbine #10 sheet 3 of 4
- A119153 Sections through foundations boiler #100 - turbine #10 sheet 2 of 4
- A10452-7
- 119161-3 Turbine foundation plan & sections. Turbine #10
- 119158-3 Foundations for transformer light and power switch equipment unit no.10. Plans & sections
- A119157-2 Foundations…..induced draft fan house section, Sheet #2
- A119156-
- 122539-A Column location plan, main station & annex
- A121329-2 Slab under precipitator
- A121317-4 Ground floor & Roof plans for stack and induced draft fan house high pressure boiler #100
- A121307-4 Plan and details of floor fill and finish operating floor
- 119168-1 Foundations for precipitator supports boiler #100
- 119164-2 Operating floor slab and boiler feed pump foundations between column lines D & DD
- 119163-4 Mill and mill motor foundations for boiler 100
- 119162-1 Turbine foundation sections. Turbine #10
- 128986-0 Location of borings west of Hudson avenue
- 129777-0 Boring sections #11 to #32 inclusive west of Hudson ave.
- 130491-0 Borings #11, 11A, 11B, 11C, 17, 17A, 23, 27, 27A, 27B, 27C, 27D. Sheet 1 of 8

- 130492-0 Borings #12, 18, 24, 28, 28A, 28B, 13, 13A, 13B, 19, 19A, 19B. Sheet 2 of 8
- 130493-0 Borings #25, 25A, 25B, 25C, 25D, 25E, 25F, 25G, 29, 29A, 29B, 29C, 29D. Sheet 3 of 8
- 130494-0 Borings #14, 20, 26, 30, 30A, 15, 21, 31, 16, 16A, 16B, 16C. Sheet 4 of 8
- 130495-0 Location plan and test borings #22, 32, 32A. Sheet 5 of 8
- 130498-0 Borings #6, 6A, 6B, 6C, 6D, 6E, 6F, 6G, 6H, 10, 10B, 10A. Sheet 8 of 8
- 130497-0 Borings #3, 3B, 3D, 3E, 3F, 4, 4A, 5, 5A, 9, 9B, 9A. Sheet 7 of 8
- 130496-0 Borings #1, 1A, 1B, 1C, 1D, 2, 2A, 2B, 7, 8, 8A. Sheet 6 of 8
- A213615-2 Demolition of coal handling structure plan, section gen. notes and ref. drawings.
- A190736-0 Boiler House - Key plans platform demolition and misc. Details Sheet 2 of 2
- A190735-0 Boiler House - Key plans platform demolition. Sheet 1of 2
- A175772-9 Foundation and enclosure for fuel oil tank for gas turbines plans and sections. Sheet 1 of 2
- A232619-1 Sewage system revision plan of little street force main
- A232620-1 Sewage system revision plan of john street and details
- A49439-1 Plan of turbine room
- A64003 Switch house cross section thru switch house looking north
- A64002 Switch house cross section thru switch house looking south
- 310101-9 Plan of boiler room basement showing foundations Y floor construction

Diagrams

- 118600-49 One Line Diagram
- 258709-8 Low Nox Electric Instrumentation
- A259026-05 Low Nox Electrical Conduit & Tray Schematic
- 1186601-27 Simplified Schematic Diagram
- 2408810-05 One Line Diagram Waste Neutralization
- A118631-7 Hudson Ave D?C Mill Feeders
- B212859-9 Demin Plant Boiler A100 13.8 kV/460v 3750 Kva Substation
- 358196-00 Hudson Ave Gas Pressure GI-3, GI-4, GI-5
- A237831 Flow Diagram Condensate System
- 118681-3 Schematic Dwg of Steam & water
- 115807-2 Annex Water Flow Diagram
- 237828-01 Brooklyn Annex Feed water -P&I
- 309252-00 P&I for Steam Send out
- 306599-02 Raw Water P&I
- 306589-01 30" Exhaust STM Header- P&I
- 306592-00 Auxiliary Steam LP Desecrator
- A239800 Main Steam Flow Diagram
- A258465-01 Low Knox Burner Front P&I Boiler 100
- A258466-01 Low Knox Burner Front P&I Boiler 100

- 301878-00 Conceptual Flow Diagram
- A302379 Fuel Oil System
- 302380-07 Fuel Oil System Tank Farm shot 1/3
- 302380-06 Fuel Oil System Tank Farm shot 2/3
- 302380-06 Fuel Oil System Tank Farm shot 3/3
- 302383-01 Boiler House Fuel Oil System
- A302384 Fuel Oil System P&I
- 306565-01 Fuel Oil to Burners P&I LP Boiler
- 306574-02 Steam Send out P&ID
- 306575-00 Main Steam & Quick Start P&ID
- 344872-01 HATF-P&I Condensate System
- 306564-00 Fuel Oil to Burners P&I

APPENDIX V - GLOSSARY

$	US$
$/kWh	US$ Per Kilowatt Hour
A	Ampere
ACDC	Air Cooled Dump Condenser
acfm	Actual Cubic Feet Per Minute
ADR	Acid Deposition Reduction
AERMOD	Epa Air Dispersion Model
AGC	Annual Guideline Concentrations
Annex	Unit 10/100
ANSI	American National Standard Institute
AQCR	Air Quality Control Region
AQRV	Air Quality Related Values
ASHRAE	American Society Of Heating Refrigeration And Airconditioning Engineers
ASME	American Society Of Mechanical Engineers
BACT	Best Available Control Technology
BSA	Board Of Standards And Appeals
Btu	British Thermal Units
Btu/kWhr	British Thermal Units Per Kilowatt Hour
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emissions Monitoring System
CEQR	City Environmental Quality Review
cfm	Cubic Feet Per Minute
CFR	Code Of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COC	Community Of Concern
Con Edison	Consolidated Edison Company Of New York
CT	Cooling Tower
DA	Department Of The Army
dBA	Decibels
DCS	Distributed Control System
DEIS	Draft Environmental Impact Statement
DEP	Department Of Environmental Protection
EA	Environmental Assessment
EAC	Early Action Compact
EAS	Environmental Assessment Statement
ECL	Environmental Conservation Law
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ERC	Emission Reduction Credits
ERRP	East River Repowering Project
ESP	Electrostatic Precipitator
f	Flouride
FGR	Flue Gas Recirculation
fps	Feet Per Second
ft	Feet
ft^2	Square Feet

G	Generator
GEP	Good Engineering Practice
GIS	Geographic Information System
gpm	Gallons Per Minute
gps	Grams Per Second
H_2SO_4	Sulfuric Acid
HA	Hudson Avenue
HAP	Hazardous Air Pollutants
hp	Horsepower
HP	High Pressure
hr	Hours
hr/yr	Hours Per Year
HVAC	Heating, Ventilating, And Air Conditioning System
Hz	Hertz (Cycles Per Second)
ID	Induced Draft
in	Inches
inHg	Inches Mercury
km	Kilometers
kpph	Thousand Pounds Per Hour
kV	Kilovolt
KVA	Kilovolt Ampere
KW	Kilowatt
kWhr	Kilowatt Hour
LAER	Lowest Achievable Emission Rate
lb	Pound (Weight)
lb/hr	Pound (Weight) Per Hour
LNB	Low No_x Burners
LP	Low Pressure
LSD	Low Sulfur Distillate (0.047%S)
LWRP	Local Waterfront Revitalization Program
m	Meter
MACT	Maximum Achievable Control Technology
MCC	Motor Control Center
mgd	Million Gallons Per Day
Mlb	Million Pounds
MMBtu	Million British Thermal Units
MMBtu/hr	Million British Thermal Units Per Hour
MOU	Memorandum Of Understanding
MVA	Mega Volt Ampere
MW	Mega Watt
MWhr	Megawatt Hour
NAAQS	National Ambient Air Quality Standards
NEC	National Electrical Code
NESCAUM	Clean Air Association Of The Northeast States
NESHAP	National Emission Standards For Hazardous Air Pollutants
NFPA	National Fire Protection Association
Ni	Nickel
NMHC	Non-Methane Hydrocarbons
NNSR	Nonattainment New Source Review
NO_2	Nitrogen Dioxide

NOx	Nitrogen Oxide
NSPS	New Source Performance Standards
NSR	New Source Review
NWP	Nationwide Permits
NYC	New York City
NYCDEP	New York City Department Of Environmental Protection
NYCRR	New York Code Of Rules And Regulations
NYS	New York State
NYSDEC	New York State Department Of Environmental Conservation
O&M	Operations And Maintenance
O_3	Ozone
^oF	Degree Fahrenheit
OTC	Ozone Transport Region
Owner	Con Edison
PB	Pb Power
Pb	Lead
pf	Power Factor
PIP	Public Involvement Program
Plant	Unit 10/100
PM	Particulate Matter
PM_{10}	Inhalable Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
ppm	Parts Per Million
ppmvd	Parts Per Million, Volumetric Dry
PSD	Prevention Of Significant Deterioration
psia	Pounds Per Square Inch Absolute
psig	Pounds Per Square Inch Gauge
PTE	Potential To Emit
RACT	Reasonably Available Control Technology
RO	Reverse Osmosis Water Treatment Plant
S	Sulfur
scf	Standard Cubic Feet
scfm	Standard Cubic Feet Per Minute
SCR	Selective Catalytic Reduction
SEQR	State Environmental Quality Review
SEQRA	State Environmental Quality Review Act
SGC	Short-Term Guideline Concentrations
SIA	Significant Impact Area
SIL	Significant Impact Levels
SIP	State Implementation Plan
SMIA	Significant Maritime And Industrial Area
SNWA	Special Natural Waterfront Areas
SO_2	Sulfur Dioxide
SO_3	Sulfate
SPDES	State Pollutant Discharge Elimination System
STG	Steam Turbine Generator
TPY	Tons Per Year
TRS	Total Reduced Sulfur
TSP	Total Suspended Particulates
ULNB	Ultra Low No_x Burners

ULSD	Ultra Low Sulfur Distillate Oil (0.0015%S)
ULURP	Uniform Land Use Review Process
USACE	US Army Corps Of Engineers
USEPA	United States Environmental Protection Agency
V	Volt
VOC	Volatile Organic Compounds
WRP	Waterfront Revitalization Program
yr	Year
$\mu g/m^3$	Micrograms Per Cubic Meter (Representing CT, ME, MA, NH, NJ, NY, RI, And VT)