Full Environmental Assessment Form
Part 1 – Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonable available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D, & E, most items contain an initial question that must be answered either "Yes" or "No." If the answer to the initial question is "Yes," complete the sub-questions that follow. If the answer to the initial question is "No," proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the project sponsor to verify that the information contained in Part 1 is accurate and complete.

A. Project and Sponsor Information

Name of Action or Project: **Pier 54 Redevelopment**		
Project Location (describe, and attach a general location map): **Hudson River Park at approximately West 13th Street, New York, NY**		
Brief Description of Proposed Action (include purpose or need): **See Attachment A, "Project Description and Environmental Screenings."**		
Name of Applicant/Sponsor: **Hudson River Park Trust**	Telephone: **212-627-2020** E-Mail: **N/A**	
Address: **Pier 40, 353 West Street**		
City/PO: **New York**	State: **NY**	Zip Code: **10014**
Project Contact (if not same as sponsor; give name and title/role): **Noreen Doyle, Executive Vice President**	Telephone: **212-627-2020** E-Mail: **ndoyle@hrpt.ny.gov**	
Address: **Same as applicant**		
City/PO: **Same as applicant**	State: **Same as applicant**	Zip Code: **Same as applicant**
Property Owner (if not same as sponsor): **Same as applicant**	Telephone: **N/A** E-Mail: **N/A**	
Address: **Same as applicant**		
City/PO: **Same as applicant**	State: **Same as applicant**	Zip Code: **Same as applicant**

B. Government Approvals

B. Government Approvals Funding, or Sponsorship. ("Funding" includes grants, loans, tax relief, and any other forms of financial assistance.)			
Government Entity		**If Yes: Identify Agency and Approval(s) Required**	**Application Date (Actual or projected)**
a. City Council, Town Board, or Village Board of Trustees	☐ Yes ■ No		
b. City, Town or Village Planning Board or Commission	■ Yes ☐ No	**City Planning Commission (CPC): modification to the 1999 waterfront certification by the CPC chairperson for Hudson River Park under waterfront zoning**	
c. City Council, Town or Village Zoning Board of Appeals	☐ Yes ■ No		
d. Other local agencies	☐ Yes ■ No		
e. County agencies	☐ Yes ■ No		
f. Regional agencies	☐ Yes ■ No		
g. State agencies	■ Yes ☐ No	**Hudson River Park Trust: Approval of lease terms and amendment to the general project plan; New York State Department of Environmental Conservation (NYSDEC): Modifications to the previously issued permit under Article 15 of the ECL Protection of Waters, and Water Quality Certification under Section 401 of the Clean Water Act**	**To be determined**
h. Federal agencies	■ Yes ☐ No	**United States Army Corps of Engineers (USACE): Modifications to the previously issued permits under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act**	**To be determined**

i. Coastal Resources

i. Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? ■ Yes ☐ No

If Yes,

ii. If the project site located in a community with an approved Local Waterfront Revitalization Program? ■ Yes ☐ No

iii. Is the project site within a Coastal Erosion Hazard Area? ☐ Yes ■ No

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? ☐ Yes ■ No

- **If Yes**, complete sections C, F and G.
- **If No**, proceed to question C.2 and complete all remaining sections and questions in Part 1.

C.2. Adopted land use plans.

a. Do any municipally adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? ■ Yes ☐ No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? ■ Yes ☐ No ***Vision 2020: New York City Comprehensive Waterfront Plan;* see Attachment B, "Land Use, Zoning, and Public Policy."**

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) ■ Yes ☐ No

If Yes, identify the plan(s):

New York State Heritage Area: Harbor Park

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? ☐ Yes ■ No

If Yes, identify the plan(s):

C.3. Zoning

a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance? ■ Yes ☐ No
If Yes, what is the zoning classification(s) including any applicable overlay district?
M2-3 zoning district, governed by special provisions of Article VI Chapter 2 of the Zoning Resolution ("Special Regulations Applying in the Waterfront Area")
Uses on the project site are also governed by the "Hudson River Park Act," Chapter 592 of the Laws of 1998, as amended in 2013.

b. Is the use permitted or allowed by a special or conditional use permit? ☐ Yes ■ No

c. Is a zoning change requested as part of the proposed action? ☐ Yes ■ No
If Yes,
i. What is the proposed new zoning for the site? ________

C.4. Existing community services.

a. In what school district is the project site located? **New York City Community School District 2**

b. What police or other public protection forces serve the project site?
The New York City Police Department (NYPD) provides police protection services to the project site.

c. Which fire protection and emergency medical services serve the project site?
The New York City Fire Department (FDNY) provides fire protection and emergency medical services to the project site.

d. What parks serve the project site?
Hudson River Park, and the High Line

D. Project Details

D.1. Proposed and Potential Development

a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)?
Open space pier for general recreation and cultural event uses.

b. a. Total acreage of the site of the proposed action? **±2.7** acres **(includes two access ramps)**
b. Total acreage to be physically disturbed? **0.0** acres*****
***The proposed project would not involve any ground disturbance; the original ±1.9-acre pier would be removed and replaced with a ±2.7-acre pier just to the north.**
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? Approx. **550** acres******
****The proposed project would be part of the approximately 550-acre Hudson River Park.**

c. Is the proposed action an expansion of an existing project or use? ■ Yes ☐ No
i. If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? %**42** Units: **2.7-acre proposed pier (including the access ramps) as compared to the original 1.9–acre pier**

d. Is the proposed action a subdivision, or does it include a subdivision? ☐ Yes ■ No
If Yes,
i. Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types)________
ii. Is a cluster/conservation layout proposed? ☐ Yes ☐ No
iii. Number of lots proposed? ________
iv. Minimum and maximum proposed lot sizes? Minimum ________ Maximum ________

e. Will proposed action be constructed in multiple phases? ☐ Yes ■ No
i. If No, anticipated period of construction: **Approximately 37** months

ii. If Yes:
- Total number of phases anticipated ________
- Anticipated commencement date of phase 1 (including demolition) ______ month ____year
- Anticipated completion date of final phase ______ month ____year
- Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: ________

f. Does the project include new residential uses? ☐ Yes ■ No

If Yes, show number of units proposed.

	One Family	Two Family	Three Family	Multiple Family (four or more)
Initial Phase	____________	____________	____________	_________________________
At completion of all phases	____________	____________	____________	_________________________

g. Does the proposed action include new non-residential construction (including expansions)? ■ Yes ☐ No

If Yes,

i. Total number of structures **1 (replacement pier within Hudson River Park)**

ii. Dimensions (in feet) of largest proposed structure: **±62.0** height; **±320** width; and **±320** length

iii. Approximate extent of building space to be heated or cooled: __**0**__ square feet

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? ☐ Yes ■ No

If Yes,

i. Purpose of the impoundment: ____

ii. If a water impoundment, the principal source of the water: ☐ Ground Water ☐ Surface water streams ☐ Other specify:

____

iii. If other than water, identify the type of impounded/contained liquids and their source.

____

iv. Approximate size of the proposed impoundment. Volume: _____________ million gallons; surface area: ______________ acres

v. Dimensions of the proposed dam or impounding structure: ________ height; _______ length

vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete):

____

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? (Not including general site preparation, grading, or installation of utilities or foundations where all excavated materials will remain onsite) ☐ Yes ■ No

If Yes:

i. What is the purpose of the excavation or dredging? ____

ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site?

- Volume (specify tons or cubic yards):_________________________________
- Over what duration of time? ____

iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them.

____

iv. Will there be onsite dewatering or processing of excavated materials? ☐ Yes ☐ No

If yes, describe.

____

v. What is the total area to be dredged or excavated? ____________________________ acres

vi. What is the maximum area to be worked at any one time? ______________________ acres

vii. What would be the maximum depth of excavation or dredging? __________________ feet

viii. Will the excavation require blasting? ☐ Yes ☐ No

ix. Summarize site reclamation goals and plan:

____

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? ■ Yes ☐ No

If Yes,

i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description):

Hudson River (There are no NYSDEC or USACE wetlands on the project site.)

ii. Describe how the proposed action would affect that water body or wetland, e.g., excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:

The proposed project would require a number of in-water construction activities related to the creation of the pier platform and the supporting piles. See Attachment F, "Natural Resources."

iii. Will proposed action cause or result in disturbance to bottom sediments? ■ Yes ☐ No

If Yes, describe: **See Attachment F, "Natural Resources."**

iv. Will proposed action cause or result in the destruction or removal of aquatic vegetation? ☐ Yes ■ No

See Attachment F, "Natural Resources."

If Yes:

- acres of aquatic vegetation proposed to be removed ____________
- expected acreage of aquatic vegetation remaining after project completion ____________
- purpose of proposed removal (e.g., beach clearing, invasive species control, boat access): ____________
- proposed method of plant removal: ____________
- if chemical/herbicide treatment will be used, specify product(s): ____________

v. Describe any proposed reclamation/mitigation following disturbance:

In-water construction of the proposed project would not result in any significant adverse impacts to aquatic biota of the Hudson River, and therefore no reclamation/mitigation is warranted. See Attachment F, "Natural Resources."

c. Will the proposed action use, or create a new demand for water? ■ Yes* ☐ No

***The proposed project would result in a minor increase in water demand associated with landscape maintenance and water usage associated with bathrooms on the proposed pier.**

If Yes:

i. Total anticipated water usage/demand per day: **Minimal**** gallons/day

**** The estimated water usage per day for the proposed project would only be the demand generated by park users and attendees at cultural events. The proposed project would not increase population density in the area. Therefore, estimated water usage for the proposed project would be minimal.**

ii. Will the proposed action obtain water from an existing public water supply? ■ Yes ☐ No

If Yes:

- Name of district or service area: **NYC Water Supply System**
- Does the existing public water supply have capacity to serve the proposal? ■ Yes ☐ No
- Is the project site in the existing district? ■ Yes ☐ No
- Is expansion of the district needed? ☐ Yes ■ No
- Do existing lines serve the project site? ■ Yes ☐ No

iii. Will line extension within an existing district be necessary to supply the project? ☐ Yes ■ No

If Yes:

- Describe extensions or capacity expansions proposed to serve this project: ____________
- Source(s) of supply for the district: ____________

iv. Is a new water supply district or service area proposed to be formed to serve the project site? ☐ Yes ☐ No

If Yes:

- Applicant/sponsor for new district: ____________
- Date application submitted or anticipated: ____________
- Proposed source(s) of supply for new district: ____________

v. If a public water supply will not be used, describe plans to provide water supply for the project:

____

vi. If water supply will be from wells (public or private), maximum pumping capacity: _____ gallons/minute.

d. Will the proposed action generate liquid wastes? ■ Yes* ☐ No

***The proposed project would include a sanitary sewage connection and permanent bathrooms, which would introduce additional sanitary sewage from the project site.**

If Yes:

i. Total anticipated liquid waste generation per day: **Minimal**** gallons/day

**** The estimated sanitary sewage generation per day for the proposed project would only be the demand generated by park users and attendees at cultural events. The proposed project would not increase population density in the area. Therefore, estimated sanitary sewage generation for the proposed project would be minimal.**

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each): **Sanitary sewage** *iii*. Will the proposed action use any existing public wastewater treatment facilities? ■ Yes ☐ No

If Yes:

- Name of wastewater treatment plant to be used: **North River Wastewater Treatment Plant**
- Name of district: **NA**
- Does the existing wastewater treatment plant have capacity to serve the project? ■ Yes ☐ No
- Is the project site in the existing district? ■ Yes ☐ No
- Is expansion of the district needed? ☐ Yes ■ No
- Do existing sewer lines serve the project site? ■ Yes ☐ No
- Will line extension within an existing district be necessary to serve the project? ☐ Yes ■ No
  If yes:
- Describe extensions or capacity expansions proposed to serve this project:

____

iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? ☐ Yes ■ No

If Yes:

- Applicant/sponsor for new district:_______________
- Date application submitted or anticipated:_______________
- What is the receiving water for the wastewater discharge?_______________

v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge, or describe subsurface disposal plans):

____

vi. Describe any plans or designs to capture, recycle or reuse liquid waste

None proposed

e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e., ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e., sheet flow) during construction or post construction? ☐ Yes ■No*

***The proposed project would create a pier with planted areas, which would result in a reduction in runoff rates to the Hudson River during rain events and an improvement in runoff water quality as compared with existing conditions and the No Action condition in which runoff from the Pier 54 platform would discharge directly to the Hudson River.**

If Yes:

i. How much impervious surface will the project create in relation to total size of project parcel?

_____ Square feet or _____ acres (impervious surface)
_____ Square feet or _____ acres (parcel size)

ii. Describe types of new point sources

____

iii. Where will the stormwater runoff be directed (i.e., on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)?

____

- If to surface waters, identify receiving water bodies or wetlands: _______________
- Will stormwater runoff flow to adjacent properties? ☐ Yes ☐ No

iv. Does proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? ☐ Yes ☐ No

f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? ☐ Yes ■ No

If Yes, identify:

i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles)

____

ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers)

____

iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation)

____

g. Will any air emission sources in D.2.f (above) require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V permit? ☐ Yes ■ No

If Yes,

i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) ☐ Yes ☐ No

ii. In addition to emissions as calculated in the application, the project will generate:

- ________ Tons/year (short tons) of Carbon Dioxide (CO_2)
- ________ Tons/year (short tons) of Nitrous Oxide (N_2O)
- ________ Tons/year (short tons) of Perfluorocarbons (PFCs)
- ________ Tons/year (short tons) of Sulfur Hexafluoride (SF_6)
- ________ Tons/year (short tons) of Carbon Dioxide equivalent of Hydroflourocarbons (HFCs)
- ________ Tons/year (short tons) of Hazardous Air Pollutants (HAPs)

h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? ☐ Yes ■ No

If Yes,

i. Estimate methane generation in tons/year (metric): ____________________

ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring):

____

i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? ☐ Yes ■ No

If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust):

____

j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? ☐ Yes ■ No*

*** A transportation screening assessment is provided in Attachment A, "Project Description and Environmental Analysis."**

If Yes:

i. When is the peak traffic expected (check all that apply): ☐ Morning ☐ Evening ☐ Weekend
☐ Randomly between hours of _______ to _______.

ii. For commercial activities only, projected number of semi-trailer truck trips/day: _____________

iii. Parking spaces: Existing _________ Proposed _________ Net increase/decrease _________

iv. Does the proposed action include any shared use parking? ☐ Yes ☐ No

v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe:

____

vi. Are public/private transportation service(s) or facilities available within ½ mile of the proposed site? ☐ Yes ☐ No

vii. Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? ☐ Yes ☐ No

viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? ☐ Yes ☐ No

k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? ■ Yes* ☐ No

***The proposed project would include an electric power connection to new transformers on the Gansevoort Peninsula to support the proposed park and cultural event uses.**

If Yes:

i. Estimate annual electricity demand during operation of the proposed action:____Minimal**____________________

**** The estimated annual electricity demand during operation of the proposed project would only be the demand generated by park operations and cultural events. The proposed project would not be an energy intensive use. Therefore, the estimated energy demand would be minimal.**

ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other):

Grid electric power

iii. Will the proposed action require a new, or an upgrade to, an existing substation? ☐ Yes ■ No

l. Hours of operation. Answer all items which apply.

i. During Construction:

- Monday – Friday: **7AM – 6 PM***
- Saturday: **7AM – 6 PM****
- Sunday: **7AM – 6 PM****
- Holidays: **7AM – 6 PM****

***Normal work would end at 3:30; all work would occur between 7AM and 6PM, per New York City laws and regulations.**

**** Necessary permits would be obtained from the appropriate agencies if work is on weekends or holidays.**

ii. During Operations:

- Monday – Friday: **6AM – 1AM**
- Saturday: **6AM – 1AM**
- Sunday: **6AM – 1AM**
- Holidays: **6AM – 1AM**

m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? ■ Yes ☐ No

If Yes:

i. Provide details including sources, time of day and duration:

See Attachment G, "Noise."

ii. Will proposed action remove existing natural barriers that could act as a noise barrier or screen? ☐ Yes ■ No

Describe: ________________________________

n. Will the proposed action have outdoor lighting? ■ Yes ☐ No

If Yes:

i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:

As currently contemplated, the proposed project would include lighting consistent with other parts of Hudson River Park. The proposed project would also include under-pier architectural lighting.

ii. Will proposed action remove existing natural barrier that could act as light barrier or screen? ☐ Yes ■ No

Describe: ________________________________

o. Does the proposed action have the potential to produce odors for more than one hour per day? ☐ Yes ■ No

If yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures: ________________________________

p. Will the proposed action include any bulk storage of petroleum (combined capacity of over 1,100 gallons) or chemical products (185 gallons in above ground storage or any amount in underground storage)? ☐ Yes ■ No

If Yes,

i. Product(s) to be stored ________________________________

ii. Volume(s) ________ per unit time ________ (e.g., month, year)

iii. Generally describe proposed storage facilities

____

q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? ☐ Yes ■ No*

***The proposed pier's landscape would be maintained using Integrated Pest Management techniques, substantially reducing the need for pesticides and other chemicals.**

If Yes:

i. Describe proposed treatment(s):

____

ii. Will the proposed action use Integrated Pest Management Practices? ■ Yes ☐ No

r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? ☐ Yes ☐ No

Not applicable - the proposed project is not a commercial or industrial project.

If Yes:

i. Describe any solid waste(s) to be generated during construction or operation of the facility:

- Construction: _______________ tons per ________________ (unit of time)
- Operation: _______________ tons per ________________ (unit of time)

ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:

- Construction:

____

____

- Operation:

____

____

iii. Proposed disposal methods/facilities for solid waste generated on-site:

- Construction:

____

____

- Operation:

____

s. Does the proposed action include construction or modification of a solid waste management facility? ☐ Yes ■ No

If Yes:

i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): ________________________________

ii. Anticipated rate of disposal/processing:

- _______ Tons/month, if transfer or other non-combustion/thermal treatment, or
- _______ Tons/hour, if combustion or thermal treatment

iii. If landfill, anticipated site life: _______________ years

t. Will proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? ☐ Yes ■ No

If Yes:

i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility:

____

____

ii. Generally describe processes or activities involving hazardous waste or constituents:

____

____

iii. Specify amount to be handled or generated: ____ tons/month

iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents:

____

____

v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? ☐ Yes ☐ No

If Yes: provide name and location of facility:

____

____

If No: Describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility:

____

E. Site and Setting of Proposed Action

E.1 Land uses on and surrounding the project site

a. Existing land uses.

i. Check all land uses that occur on, adjoining and near the project site.

■ Urban ■ Industrial ■ Commercial ☐ Residential (suburban) ☐ Rural (non-farm)
☐ Forest ☐ Agriculture ■ Aquatic ☐ Other (specify): ___________________

ii. If mix of uses, generally describe:

Residential, retail, office, hotel, industrial, open space, and transportation and utility.

b. Land uses and covertypes on the project site.

Land use or covertype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces			
• Forested			
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)			
• Agricultural (includes active orchards, field, greenhouse, etc.)			
• Surface water features (lakes, ponds, streams, rivers, etc.)			
• Wetlands (freshwater or tidal)			
• Non-vegetated (bare rock, earth or fill)			
• Other Describe: **Public Park Pier**	**±1.9 (original Pier 54 only)**	**±2.7 (proposed project only)**	**+0.8**

c. Is the project site presently used by members of the community for public recreation? ■ Yes ☐ No

i. If yes: explain:

Pier 54, which was previously open to the public for recreation and various events, is now largely closed due to disrepair. Approximately ¼ of the pier's original footprint remains open for public use. The general public can still access the portion of the pier that is still open, and a Learn to Bike program also makes use of the pier. In the No Action condition, the pier is assumed to be rebuilt in its current location and reopened to the public for recreation and cultural events, as occurred in the past.

d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? ■ Yes ☐ No

If Yes:

i. Identify Facilities:

Day Care Centers: San Jose Day Nursery School, The Children's Garden, Chelsea Day School, Corlears School, and West Village Nursery School Senior Centers: Hudson Guild Senior Services

e. Does the project site contain an existing dam? ☐ Yes ■ No

If Yes:

i. Dimensions of the dam and impoundment:

- Dam height: ________________________ feet
- Dam length: ________________________ feet
- Surface area: ________________________ acres
- Volume impounded: ____________________ gallons OR acre-feet

ii. Dam's existing hazard classification: ________________________

iii. Provide date and summarize results of last inspection:

f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? ☐ Yes ■ No

If Yes:

i. Has the facility been formally closed?

- If yes, cite sources/documentation: ________________________

ii. Describe the location of the project site relative to the boundaries of the solid waste management facility:

iii. Describe any development constraints due to the prior solid waste activities:

____

g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store, and/or dispose of hazardous waste? ☐ Yes ■ No

If Yes:

i. Describe waste(s) handled and waste management activities, including approximate time when activities occurred:

____

h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? ☐ Yes ■ No

If Yes:

i. Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply: ☐ Yes ■ No

☐ Yes – Spills Incidents database Provide DEC ID number(s): ______________________________

☐ Yes – Environmental Site Remediation database Provide DEC ID number(s): ______________________________

■ Neither database

ii. If site has been subject of RCRA corrective activities, describe control measures:

____

iii. Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database? ■ Yes ☐ No

If yes, provide DEC ID number(s): **V00530, C231036, V00624, and C231056**

iv. If yes to (i), (ii) or (iii) above, describe current status of site(s):

The listings relate to former manufactured gas plant (MGP) facilities located to the west of Hudson River Park between West 17th and 20th Streets. Although some portions have been remediated, others have not.

v. Is the project site subject to an institutional control limiting property uses? ☐ Yes ■ No

- If yes, DEC site ID number: ______________________________
- Describe the type of institutional control (e.g., deed restriction or easement): ______________________________
- Describe any use limitations: ______________________________
- Describe any engineering controls: ______________________________
- Will the project affect the institutional or engineering controls in place? ☐ Yes ☐ No
- Explain: ______________________________

____

E.2. Natural Resources On or Near Project Site

a. What is the average depth to bedrock on the project site? **Approximately 100 feet**

b. Are there bedrock outcroppings on the project site? ☐ Yes ■ No

If Yes, what proportion of the site is comprised of bedrock outcroppings? ________________%

c. Predominant soil type(s) present on project site:

Hudson River bottom sediment comprised primarily of silt and clay **100**%

d. What is the average depth to the water table on the project site? Average: **0** feet*****

***The project site is located within the Hudson River.**

e. Drainage status of project site soils:
☐ Well Drained: _____% of Site
☐ Moderately Well Drained: _____% of Site
☐ Poorly Drained: _____% of Site

Not applicable. The project site is located within the Hudson River.

f. Approximate proportion of proposed action site with slopes: : ☐ 0-10%: _____% of Site ☐ 10-15%: _____% of Site ☐ 15% or greater: _____% of Site **Not applicable. The project site is located within the Hudson River.**	
g. Are there any unique geologic features on the project site? If Yes, describe: ________________________________ ________________________________	☐ Yes ■ No
h. Surface water features:	
i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)?	■ Yes ☐ No
ii. Do any wetlands or other waterbodies adjoin the project site? If Yes to either i or ii, continue. If No, skip to E.2.1.	■ Yes ☐ No
iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency?	■ Yes ☐ No
iv. For each identified regulated wetland and waterbody on the project site, provide the following information. • Streams: Name **Hudson River** Classification **I** • Lakes or Ponds: Name ______________ Classification______________ • Wetlands: Name ______________ Approximate Size______________ Wetland No. (if regulated by DEC) ______________	
v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? If yes, name of impaired water body/bodies and basis for listing as impaired: **Hudson River (Class I) – Priority Organics – Fish Consumption** ________________________________	■ Yes ☐ No
i. Is the project site in a designated Floodway?	☐ Yes ■ No
j. Is the project site in the 100 year Floodplain?	■ Yes ☐ No
k. Is the project site in the 500 year Floodplain?	☐ Yes ■ No
l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? If Yes: *i.* Name of aquifer: ________________________________	☐ Yes ■ No
m. Identify the predominant wildlife species that occupy or use the project site: **See Attachment F, "Natural Resources."**	
n. Does the project site contain a designated significant natural community? If Yes: *i.* Describe the habitat/community (composition, function, and basis for designation): ________________________________ ________________________________ *ii.* Source(s) of description or evaluation: ________________________________ *iii.* Extent of community/habitat: • Currently: ______________ acres • Following completion of project as proposed: ______________ acres • Gain or loss (indicate + or -): ______________ acres	☐ Yes ■ No
o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? **Shortnose and Atlantic sturgeon during migration, and sea turtles (loggerhead, green, Kemp's ridley, and leatherback) as occasional transient individuals. See Attachment F, "Natural Resources.**	■ Yes ☐ No

p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? **See Attachment F, "Natural Resources."**	■ Yes ☐ No
q. Is the project site or adjoining area currently used for hunting, trapping, fishing, or shell fishing? If yes, give a brief description of how the proposed action may affect that use: ____ ____	☐ Yes ■ No
E.3. Designated Public Resources On or Near the Project Site	
a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Marks Law, Article 25-AA, Sections 303 and 304? If Yes, provide county plus district name/number: ________________________	☐ Yes ■ No
b. Are agricultural lands consisting of highly productive soils present? *i*. If Yes: acreage(s) on project site? ________________ *ii*. Source(s) of soil rating(s) ________________	☐ Yes ■ No
c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? If Yes: *i*. Nature of the natural landmark: ☐ Biological Community ☐ Geological Feature *ii*. Provide brief description of landmark, including values behind designation and approximate size/extent: ____ ____	☐ Yes ■ No
d. Is the project site located in or does it adjoin a state-listed Critical Environmental Area? If Yes: *i*. CEA name: ________________________ *ii*. Basis for designation: ________________________ *iii*. Designating agency and date: ________________________	☐ Yes ■ No
e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on, or has been nominated by the NYS Board of Historic Preservation for inclusion on, the State or National Register of Historic Places? If Yes: *i*. Nature of historic/archaeological resource: ☐ Archaeological Site ■ Historic Building or District *ii*. Name: **Pier 57** *iii*. Brief description of attributes on which listing is based: **Constructed as an ocean liner pier in 1950–1954 at the foot of West 15th Street, Pier 57 is significant as an innovative engineering design. Pier 57 is supported primarily by the buoyancy of three hollow concrete boxes that form the superstructure of the pier and the headhouse.**	■ Yes ☐ No
f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory?	☐ Yes ■ No
g. Have additional archaeological or historic site(s) or resourced been identified on the project site? If Yes: *i*. Describe possible resource(s): **The project site includes a portion of the Hudson River bulkhead.** *ii*. Basis for identification: **The Hudson River bulkhead has been determined eligible for listing on the State and National Registers of Historic Places.**	■ Yes ☐ No

h. Is the project site within five miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource?	■ Yes ☐ No
If Yes:	
i. Identify resource: **Hudson River Park, Hudson River, New Jersey Palisades, Hudson River bulkhead (S/NR-eligible) from Battery Place to West 59th Street, Pier 57 (S/NR), the High Line (S/NR-eligible), Gansevoort Market Historic District (S/NR, NYCL).**[1]	
ii. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.): **State or local park, National Natural Landmark, S/NR-listed or S/NR-eligible**	
iii. Distance between project and resource: **within 400 feet (or visible from)** miles.	
i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666?	☐ Yes ■ No
If Yes:	
i. Identify the name of the river and its designation: ______	
ii. Is the activity consistent with development restrictions contain in 6NYCRR Part 666?	☐ Yes ☐ No

F. Additional Information
Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

G. Verification
I certify that the information provided is true to the best of my knowledge.

Applicant/Sponsor Name Hudson River Park Trust Date 2-11-15

Signature ______ Title General Counsel

William Heinzen

[1] While there are other aesthetic resources located within 5 miles of the project site, due to the dense nature of development within New York City, the proposed development would not affect views to those resources. The effects of the proposed development on visual resources are assessed in Attachment E, "Urban Design and Visual Resources."

Full Environmental Assessment Form
Part 2 – Identification of Potential Project Impacts

Part 2 is to be completed by the lead agency. Part 2 is designed to help the lead agency inventory all potential resources that could be affected by a proposed project or action. We recognize that the lead agency's reviewer(s) will not necessarily be environmental professionals. So, the questions are designed to walk a reviewer through the assessment process by providing a series of questions that can be answered using the information found in Part 1. To further assist the lead agency in completing Part 2, the form identifies the most relevant questions in Part 1 that will provide the information needed to answer the Part 2 question. When Part 2 is completed, the lead agency will have identified the relevant environmental areas that may be impacted by the proposed activity.

If the lead agency is a state agency **and** the action is in any Coastal Area, complete the Coastal Assessment Form before proceeding with this assessment.

Tips for completing Part 2:

- Review all of the information provided in Part 1.
- Review any application, maps, supporting materials and the Full EAF Workbook.
- Answer each of the 18 questions in Part 2.
- If you answer "**Yes**" to a numbered question, please complete all the questions that follow in that section.
- If you answer "**No**" to a numbered question, move on to the next numbered section.
- Check appropriate column to indicate the anticipated size of the impact.
- Proposed projects that would exceed a numeric threshold contained in a question should result in the reviewing agency checking the box "Moderate to large impact may occur."
- The reviewer is not expected to be an expert in environmental analysis.
- If you are not sure or undecided about the size of an impact, it may help to review the sub-questions for the general question and consult the workbook.
- When answering a question consider all components of the proposed activity, that is, the "whole action".
- Consider the possibility for long-term and cumulative impacts as well as direct impacts.
- Answer the question in a reasonable manner considering the scale and context of the project.

1. Impact on Land
Proposed action may involve construction on, or physical alteration of the land surface of the proposed site. (See Part 1.D.1)
If "Yes", answer questions a – j. If "No", move on to Section 2.
***See Attachment F, "Natural Resources," and Attachment H, "Construction."**

■ NO* ☐ YES

	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may involve construction on land where depth to water table is less than 3 feet.	E2d	☐	☐
b. The proposed action may involve construction on slopes of 15% or greater.	E2f	☐	☐
c. The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.	E2a	☐	☐
d. The proposed action may involve the excavation and removal of more than 1,000 tons of natural material.	D2a	☐	☐
e. The proposed action may involve construction that continues for more than one year or in multiple phases.	D1e	☐	☐
f. The proposed action may result in increased erosion, whether from physical disturbance or vegetation removal (including from treatment by herbicides).	D2e, D2q	☐	☐
g. The proposed action is, or may be, located within a Coastal Erosion hazard area.	B1i	☐	☐
h. Other impacts: ______________________________ ______________________________		☐	☐

2. Impact on Geological Features The proposed action may result in the modification or destruction of, or inhibit access to, any unique or unusual land forms on the site (e.g., cliffs, dunes, minerals, fossils, caves). (See Part 1.E.2.g) *If "Yes", answer questions a – c. If "No", move on to Section 3.* ***See Attachment F, "Natural Resources."**	■ NO*		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. Identify specific land form(s) attached: ______________________	E2g	☐	☐
b. The proposed action may affect or is adjacent to a geological feature listed as a registered National Natural Landmark. Specific feature: ______________________	E3c	☐	☐
c. Other Impacts: ______________________			

3. Impacts on Surface Water The proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes). (See Part 1.D.2, E.2.h) *If "Yes", answer questions a – l. If "No", move on to Section 4.* ***See Attachment F, "Natural Resources."**	☐ NO		■ YES*
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may create a new water body.	D2b, D1h	■	☐
b. The proposed action may result in an increase or decrease of over 10% or more than a 10 acre increase or decrease in the surface area of any body of water.	D2b	■	☐
c. The proposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.	D2a	■	☐
d. The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed or banks of any other water body.	E2h	■	☐
e. The proposed action may create turbidity in a waterbody, either from upland erosion, runoff or by disturbing bottom sediments.	D2a, D2h	■	☐
f. The proposed action may include construction of one or more intake(s) for withdrawal of water from surface water.	D2c	■	☐
g. The proposed action may include construction of one or more outfall(s) for discharge of wastewater to surface water(s).	D2d	■	☐
h. The proposed action may cause soil erosion, or otherwise create a source of stormwater discharge that may lead to siltation or other degradation of receiving water bodies.	D2e	■	☐
i. The proposed action may affect the water quality of any water bodies within or downstream of the site of the proposed action.	E2h	■	☐
j. The proposed action may involve the application of pesticides or herbicides in or around any water body.	D2q, E2h	■	☐
k. The proposed action may require the construction of new, or expansion of existing, wastewater treatment facilities.	D1a, D2d	■	☐
l. Other Impacts: ______________________		■	☐

4. Impact on Groundwater

The proposed action may result in new or additional use of ground water, or may have the potential to introduce contaminants to ground water or an aquifer. (See Part 1.D.2.a, D.2.c, D.2.d, D.2.p, D.2.q, D.2.t)

If "Yes", answer questions a – h. If "No", move on to Section 5.

■ NO ☐ YES

	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may require new water supply wells, or create additional demand on supplies from existing water supply wells.	D2c	☐	☐
b. Water supply demand from the proposed action may exceed safe and sustainable withdrawal capacity rate of the local supply or aquifer. Cite Source: ___________________	D2c	☐	☐
c. The proposed action may allow or result in residential uses in areas without water and sewer services.	D1a, D2c	☐	☐
d. The proposed action may include or require wastewater discharged to groundwater.	D2d, E2l	☐	☐
e. The proposed action may result in the construction of water supply wells in locations where groundwater is, or is suspected to be, contaminated.	D2c, E1f, E1g, E1h	☐	☐
f. The proposed action may require the bulk storage of petroleum or chemical products over ground water or an aquifer.	D2p, E2l	☐	☐
g. The proposed action may involve the commercial application of pesticides within 100 feet of potable drinking water or irrigation sources.	E2h, D2q, E2l, D2c	☐	☐
h. Other impacts: ____		☐	☐

5. Impact on Flooding

The proposed action may result in development on lands subject to flooding. (See Part 1.E.2)

If "Yes", answer questions a – g. If "No", move on to Section 6.

***See Attachment F, "Natural Resources."**

☐ NO ■ YES*

	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may result in development in a designated floodway.	E2i	■	☐
b. The proposed action may result in development within a 100 year floodplain.	E2j	■	☐
c. The proposed action may result in development within a 500 year floodplain.	E2k	■	☐
d. The proposed action may result in, or require, modification of existing drainage patterns.	D2b, D2e	■	☐
e. The proposed action may change flood water flows that contribute to flooding.	D2b, E2i, E2j, E2k	■	☐
f. If there is a dam located on the site of the proposed action, is the dam in need of repair or upgrade?	E1e	■	☐
g. Other Impacts: ____		■	☐

6. Impacts on Air The proposed action may include a state regulated air emission source. (See Part 1.D.2.f, D2.h., D.2.g) *If "Yes", answer questions a – f. If "No", move on to Section 7.* ***See Attachment A, "Project Description and Environmental Analysis."**	■ NO*	☐ YES	
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. If the proposed action requires federal or state air emission permits, the action may also emit one or more greenhouse gases at or above the following levels:			
i. More than 1000 tons/year of carbon dioxide (CO_2)	D2g	☐	☐
ii. More than 3.5 tons/year of nitrous oxide (N_2O)	D2g	☐	☐
iii. More than 1000 tons/year of carbon equivalent of perfluorocarbons (PFCs)	D2g	☐	☐
iv. More than .045 tons/year of sulfur hexafluoride (SF_6)	D2g	☐	☐
v. More than 1000 tons/year of carbon dioxide equivalent of [hydrochloroflurocarbons (HCFCs)] <u>hydrochloroflourocarbons (HFCs)</u> emissions	D2g	☐ ☐	☐ ☐
vi. 43 tons/year or more of methane	D2h	☐	☐
b. The proposed action may generate 10 tons/year or more of any one designated hazardous air pollutant, or 25 tons/year or more of any combination of such hazardous air pollutants.	D2g	☐	☐
c. The proposed action may require a state air registration, or may produce an emissions rate of total contaminants that may exceed 5 lbs. per hour, or may include a heat source capable of producing more than 10 million BTUs per hour.	[D2f], D2g	☐	☐
d. The proposed action may reach 50% of any [two or more] of the thresholds in "a" through "c", above.	[D1g, D2k] <u>D2g</u>	☐	☐
e. The proposed action may result in the combustion or thermal treatment of more than 1 ton of refuse per hour.	D2s	☐	☐
f. Other impacts: ____		☐	☐

7. Impact on Plants and Animals The proposed action may result in a loss of flora or fauna. (See Part 1.E.2.m.-q.) *If "Yes", answer questions a – j. If "No", move on to Section 8.* ***See Attachment F, "Natural Resources."**	■ NO*	☐ YES	
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may cause reduction in population or loss of individuals of any threatened or endangered species, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2o	☐	☐
b. The proposed action may result in a reduction or degradation of any habitat used by any rare, threatened or endangered species, as listed by New York State or the federal government.	E2o	☐	☐
c. The proposed action may cause reduction in population, or loss of individuals, or any species of special concern or conservation need, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2p	☐	☐
d. The proposed action may result in a reduction or degradation of any habitat used by any species of special concern and conservation need, as listed by New York State or the Federal government.	E2p	☐	☐
e. The proposed action may diminish the capacity of a registered National Natural Landmark to support the biological community it was established to protect.	E3c	☐	☐
f. The proposed action may result in the removal of, or ground disturbance in, any portion of a designated significant natural community. Source: ______________________________	E2n	☐	☐
g. The proposed action may substantially interfere with nesting/breeding, foraging, or over-wintering habitat for the predominant species that occupy or use the project site.	E2m	☐	☐
h. The proposed action requires the conversion of more than 10 acres of forest, grassland or any other regionally or locally important habitat. Habitat type & information source: ________________________________	E1b	☐	☐
i. Proposed action (commercial, industrial or recreational projects, only) involves use of herbicides or pesticides.	D2q	☐	☐
j. Other impacts: ____		☐	☐

8. Impact on Agricultural Resources The proposed action may impact agricultural resources. (See Part 1.E.3.a. and b.) *If "Yes", answer questions a – h. If "No", move on to Section 9.*	■ NO		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may impact soil classified within soil group 1 through 4 of the NYS Land Classification System.	E2c, E3b	☐	☐
b. The proposed action may sever, cross or otherwise limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc.).	E1a, E1b	☐	☐
c. The proposed action may result in the excavation or compaction of the soil profile of active agricultural land.	E3b	☐	☐
d. The proposed action may irreversibly convert agricultural land to non-agricultural uses, either more than 2.5 acres if located in an Agricultural District, or more than 10 acres if not within an agricultural district.	E1b, E3a	☐	☐
e. The proposed action may disrupt or prevent installation or an agricultural land management system.	E1a, E1b	☐	☐
f. The proposed action may result, directly or indirectly, in increased development potential or pressure on farmland.	C2c, C3, D2c, D2d	☐	☐
g. The proposed project is not consistent with the adopted municipal Farmland Protection Plan.	C2c	☐	☐
h. Other impacts: ______________________________		☐	☐

9. Impact on Aesthetic Resources The land use of the proposed action are obviously different from, or are in sharp contrast to, current land use patterns between the proposed project and a scenic or aesthetic resource. (Part 1.E.1.a, E.1.b, E.3.h) *If "Yes", answer questions a – g. If "No", go to Section 10.* ***See Attachment E, "Urban Design and Visual Resources."**	■ NO*		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. Proposed action may be visible from any officially designated federal, state, or local scenic or aesthetic resource.	E3h	☐	☐
b. The proposed action may result in the obstruction, elimination, or significant screening of one or more officially designated scenic views.	E3h, C2b	☐	☐
c. The proposed action may be visible from publicly accessible vantage points: i. Seasonally (e.g., screened by summer foliage, but visible during other seasons) ii. Year round	E3h	☐	☐
d. The situation or activity in which viewers are engaged while viewing the proposed action is: i. Routine travel by residents, including travel to and from work ii. Recreational or tourism based activities	E3h E2q, E1c	☐	☐
e. The proposed action may cause a diminishment of the public enjoyment and appreciation of the designated aesthetic resource.	E3h	☐	☐
f. There are similar projects visible within the following distance of the proposed project: 0-½ mile ½-3 mile 3-5 mile 5+ mile	D1a, E1a, D1f, D1g	☐	☐
g. Other impacts: ______________________________		☐	☐

10. Impact on Historic and Archaeological Resources The proposed action may occur in or adjacent to a historic or archaeological resource. (Part 1.E.3.e, f. and g.) *If "Yes", answer questions a – e. If "No", go to Section 11.* ***See Attachment D, "Historic and Cultural Resources."**	☐ NO		■ YES*
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may occur wholly or partially within, or substantially contiguous to, any buildings, archaeological site or district which is listed on or has been nominated by the NYS Board of Historic Preservation for inclusion on the State or National Register of Historic Places.	E3e	■	☐
b. The proposed action may occur wholly or partially within, or substantially contiguous to, an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory.	E3f	■	☐
c. The proposed action may occur wholly or partially within, or substantially contiguous to, an archaeological site not included on the NY SHPO inventory. Source: **1998 Final Environmental Impact Statement (FEIS) for Hudson River Park**	E3g	■	☐
d. Other impacts: ______________________________________		■	☐
e. If any of the above (a-d) are answered "Yes," continue with the following questions to help support conclusions in Part 3: i. The proposed action may result in the destruction or alteration of all or part of the site or property. ii. The proposed action may result in the alteration of the property's setting or integrity. iii. The proposed action may result in the introduction of visual elements which are out of character with the site or property, or may alter its setting.	E3e, E3g, E3f E3e, E3f, E3g, E1a, E1b E3e, E3f, E3g, E3h, C2, C3	☐	☐

11. Impact on Open Space and Recreation The proposed action may result in a loss of recreational opportunities or a reduction of an open space resource as designated in any adopted municipal open space plan. (See Part 1.C.2.c, E.1.c, E.2.q) *If "Yes", answer questions a – e. If "No", go to Section 12.* ***See Attachment A, "Project Description and Environmental Analysis" and Attachment F, "Natural Resources."**	■ NO*		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may result in an impairment of natural functions, or "ecosystem services", provided by an undeveloped area including but not limited to stormwater storage, nutrient cycling, wildlife habitat.	D2e, E1b, E2h, E2m, E2o, E2n, E2p	☐	☐
b. The proposed action may result in the loss of a current or future recreational resource.	C2a, E1c, C2c, E2q	☐	☐
c. The proposed action may eliminate open space or recreational resource in an area with few such resources.	C2a, C2c, E1c, E2q	☐	☐
d. The proposed action may result in loss of an area now used informally by the community as an open space resource.	C2c, E1c	☐	☐
e. Other impacts: ______________________________________ ______________________________________		☐	☐

12. Impact on Critical Environmental Areas The proposed action may be located within or adjacent to a critical environmental area (CEA). (See Part 1.E.3.) *If "Yes", answer questions a – c. If "No", go to Section 13.*	■ NO		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may result in a reduction in the quantity of the resource or characteristic which was the basis for designation of the CEA.	E3d	☐	☐
b. The proposed action may result in a reduction in the quality of the resource or characteristic which was the basis for designation of the CEA.	E3d	☐	☐
c. Other impacts: ______________________________		☐	☐

13. Impact on Transportation The proposed action may result in a change to existing transportation systems. (See Part 1.D.2.j) *If "Yes", answer questions a – f. If "No", go to Section 14.* ***See Attachment A, "Project Description and Environmental Analysis."**	☐ NO		■ YES*
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. Projected traffic increase may exceed capacity of existing road network.	D2j	■	☐
b. The proposed action may result in the construction of paved parking area for 500 or more vehicles.	D2j	■	☐
c. The proposed action will degrade existing transit access.	D2j	■	☐
d. The proposed action will degrade existing pedestrian or bicycle accommodations.	D2j	■	☐
e. The proposed action may alter the present pattern of movement of people or goods.	D2j	■	☐
f. Other impacts: ______________________________		☐	☐

14. Impact on Energy The proposed action may cause an increase in the use of any form of energy. (See Part 1.D.2.k) *If "Yes", answer questions a – e. If "No", go to Section 15.* ***See Attachment A, "Project Description and Environmental Analysis"**	☐ NO		■ YES*
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action will require a new, or an upgrade to an existing, substation.	D2k	■	☐
b. The proposed action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two-family residences or to serve a commercial or industrial use.	D1f, D1q, D2k	■	☐
c. The proposed action may utilize more than 2,500 MWhrs per year of electricity.	D2k	■	☐
d. The proposed action may involve heating and/or cooling of more than 100,000 square feet of building area when completed.	D1g	■	☐
e. Other Impacts: ______________________________		☐	☐

15. Impact on Noise, Odor, and Light The proposed action may result in an increase in noise, odors, or outdoor lighting. (See Part 1.D.2.m., n., and o.) *If "Yes", answer questions a – f. If "No", go to Section 16.* ***The proposed project would result in an increase in noise as compared to the No Action condition and would introduce additional outdoor lighting. See Attachment G, "Noise" and Attachment F, "Natural Resources."**	☐ NO		■ YES*
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may produce sound above noise levels established by local regulation.	D2m	■	☐
b. The proposed action may result in blasting within 1,500 feet of any residence, hospital, school, licensed day care center, or nursing home.	D2m, E1d	■	☐
c. The proposed action may result in routine odors for more than one hour per day.	D20	■	☐
d. The proposed action may result in light shining onto adjoining properties.	D2n	■	☐
e. The proposed action may result in lighting creating sky-glow brighter than existing area conditions.	D2n, E1a	■	☐
f. Other Impacts: ______________________________		■	☐

16. Impact on Human Health The proposed action may have an impact on human health from exposure to new or existing sources of contaminants. (See Part 1.D.2.q. E.1.d. f. g. and h.) *If "Yes", answer questions a – m. If "No", go to Section 17.*	■ NO		☐ YES
	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action is located within 1500 feet of a school, hospital, licensed day care center, group home, nursing home, or retirement community.	E1d	☐	☐
b. The site of the proposed action is currently undergoing remediation.	E1g, E1h	☐	☐
c. There is a completed emergency spill remediation, or a completed environmental site remediation on, or adjacent to, the site of the proposed action.	E1g, E1h	☐	☐
d. The site of the action is subject to an institutional control limiting the use of the property (e.g., easement, or deed restriction).	E1g, E1h	☐	☐
e. The proposed action may affect institutional control measures that were put in place to ensure that the site remains protective of the environment and human health.	E1g, E1h	☐	☐
f. The proposed action has adequate control measures in place to ensure that future generation, treatment and/or disposal of hazardous wastes will be protective of the environment and human health.	D2t	☐	☐
g. The proposed action involves construction or modification of a solid waste management facility.	D2q, E1f	☐	☐
h. The proposed action may result in the unearthing of solid or hazardous waste.	D2q, E1f	☐	☐
i. The proposed action may result in an increase in the rate of disposal, or processing, of solid waste.	D2r, D2s	☐	☐
j. The proposed action may result in excavation or other disturbance within 2000 feet of a site used for the disposal of solid or hazardous waste.	E1f, E1g, E1h	☐	☐
k. The proposed action may result in the migration of explosive gases from a landfill site to adjacent off site structures.	E1f, E1g	☐	☐
l. The proposed action may result in the release of contaminated leachate from the project site.	D2s, E1f, D2r	☐	☐
m. Other impacts: ______________________________		☐	☐

17. Consistency with Community Plans

The proposed action is not consistent with adopted land use plans. (see Part 1.C.1, C.2 and C.3)

If "Yes", answer questions a – h. If "No", go to Section 18.

***See Attachment B, "Land Use, Zoning, and Public Policy."**

■ NO* ☐ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action's land use components may be different from, or in sharp contrast to, current surrounding land use pattern(s).	C2, C3, D1a, E1a, E1b	☐	☐
b. The proposed action will cause the permanent population of the city, town or village in which the project is located to grow by more than 5%.	C2	☐	☐
c. The proposed action is inconsistent with local land use plans or zoning regulations.	C2, C2, C3	☐	☐
d. The proposed action is inconsistent with any County plans, or other regional land use plans.	C2, C2	☐	☐
e. The proposed action may cause a change in the density of development that is not supported by existing infrastructure or is distant from existing infrastructure.	C3, D1c, D1d, D1f, D1d, E1b	☐	☐
f. The proposed action is located in an area characterized by low density development that will require new or expanded public infrastructure.	C4, D2c, D2d, D2j	☐	☐
g. The proposed action may induce secondary development impacts (e.g., residential or commercial development not included in the proposed action).	C2a	☐	☐
h. Other impacts: ____		☐	☐

18. Consistency with Community Character

The proposed project is inconsistent with the existing community character. (See Part 1.C.2, C.3, D.2, E.3)

If "Yes", answer questions a – g. If "No", Proceed to Part 3.

***See Attachment D, "Historic and Cultural Resources," and Attachment E, "Urban Design and Visual Resources."**

■ NO* ☐ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may replace or eliminate existing facilities, structures, or areas of historic importance to the community.	E3e, E3f, E3g	☐	☐
b. The proposed action may create a demand for additional community services (e.g., schools, police and fire).	C4	☐	☐
c. The proposed action may displace affordable or low-income housing in an area where there is a shortage of such housing.	C2, C3, D1f, D1g, E1a	☐	☐
d. The proposed action may interfere with the use or enjoyment of officially recognized or designated public resources.	C2, E3	☐	☐
e. The proposed action is inconsistent with the predominant architectural scale and character.	C2, C3	☐	☐
f. Proposed action is inconsistent with the character of the existing natural landscape.	C2, C3, E1a, E1b, E2g, E2h	☐	☐
g. Other Impacts: ____		☐	☐

Full Environmental Assessment Form
Part 3 – Evaluation of the Magnitude and Importance of Project Impacts
and
Determination of Significance

Part 3 provides the reasons in support of the determination of significance. The lead agency must complete Part 3 for every question in Part 2 where the impact has been identified as potentially moderate to large or where there is a need to explain why a particular element of the proposed action will not, or may, result in a significant adverse environmental impact.

Based on the analysis in Part 3, the lead agency must decide whether to require an environmental impact statement to further assess the proposed action or whether available information is sufficient for the lead agency to conclude that the proposed action will not have a significant adverse environmental impact. By completing the certification on the next page, the lead agency can complete its determination of significance.

Reasons Supporting This Determination:
To complete this section:

- Identify the impact based on the Part 2 responses and describe its magnitude. Magnitude considers factors such as severity, size or extent of an impact.
- Assess the importance of the impact. Importance relates to the geographic scope, duration, probability of the impact occurring, number of people affected by the impact and any additional environmental consequences if the impact were to occur.
- The assessment should take into consideration any design element or project changes.
- Repeat this process for each Part 2 question where the impact has been identified as potentially moderate to large or where there is a need to explain why a particular element of the proposed action will not, or may, result in a significant adverse environmental impact.
- Provide the reason(s) why the impact may, or will not, result in a significant adverse environmental impact
- For Confidential Negative Declarations identify the specific condition(s) imposed that will modify the proposed actions so that no significant adverse environmental impacts will result.
- Attach additional sheets, as needed.

See Attachments A through H.

Determination of Significance – Type 1 and Unlisted Actions

SEQR Status: ☒ Type 1 ☐Unlisted

Identify Portions of EAF completed for this Project: ☒ Part 1 ☒ Part 2 ☒ Part 3

Upon review of the information recorded on this EAF, as noted, plus this additional support information

and considering both the magnitude and importance of each identified potential impact, it is the conclusion of the **Hudson River Park Trust** as lead agency that:

☒ A. This project will result in no significant adverse impacts on the environment, and, therefore, an environmental impact statement need not be prepared. Accordingly, this negative declaration is issued.

☐ B. Although this project could have a significant adverse impact on the environment, that impact will be avoided or substantially mitigated because of the following conditions which will be required by the lead agency:

There will, therefore, be no significant adverse impacts from the project as conditioned, and, therefore, this conditioned negative declaration is issued. A conditioned negative declaration maybe be used only for UNLISTED actions (see 6 NYCRR 617.d).

☐ C. This Project may result in one or more significant adverse impacts on the environment, and an environmental impact statement must be prepared to further assess the impact(s) and possible mitigation and to explore alternatives to avoid or reduce those impacts. Accordingly, this positive declaration is issued.

Name of Action: **Pier 54 Redevelopment**

Name of Lead Agency: **Hudson River Park Trust**

Name of Responsible Officer in Lead Agency: **William Heinzen**

Title of Responsible Officer: **General Counsel**

Signature of Responsible Officer in Lead Agency: Date: 2-11-15

Signature of Preparer (if different from Responsible Officer): Date: **February 10, 2015**

Rebecca Gafvert, Senior
Planner/Economist
AKRF, Inc.

For Further Information:

Contact Person: **William Heinzen, General Counsel**

Address: **Hudson River Park Trust, Pier 40, 353 West Street, New York, NY 10007**

Telephone Number: **(212) 627-2020**

E-mail: **wheinzen@hrpt.ny.gov**

For Type 1 Actions and Conditioned Negative Declarations, a copy of this Notice is sent to:

Chief Executive Officer of the political subdivision in which the action will be principally located (e.g., Town / City / Village of)
Other involved agencies (if any)
Applicant (if any)
Environmental Notice Bulletin: http://www.dec.ny.gov/enb/enb.html

A. PROJECT IDENTIFICATION

The Hudson River Park Trust (HRPT) (the project sponsor) proposes to redevelop Pier 54 and reopen it as a public park pier for use as both a general recreation and cultural events space capable of hosting programming for up to 5,000 attendees (the peak event for the proposed project). The proposed project would involve the construction of a new public access pier with a different overwater footprint, containing approximately 117,000-gross-square-feet (gsf) of open space and the creation of approximately 1.9 acres of pile field habitat. The redeveloped Pier 54 would be located between the current Pier 54 footprint and the Pier 56 pile field to the north, within Hudson River Park at approximately West 13th Street (see **Figure A-1**).

The proposed project requires discretionary actions from HRPT and the New York State Department of Environmental Conservation (NYSDEC), as well as approvals from the U.S. Army Corps of Engineers (USACE) for in-water work. Thus, the proposed project is subject to environmental review under the New York State Environmental Quality Review Act (SEQRA) regulations and guidelines. Because the proposed project is located in New York City, New York City's *City Environmental Quality Review (CEQR) Technical Manual* will serve as a general guide on the methodologies and impact criteria for evaluating the proposed project's potential effects on the various environmental areas of analysis.

B. PROPOSED PROJECT

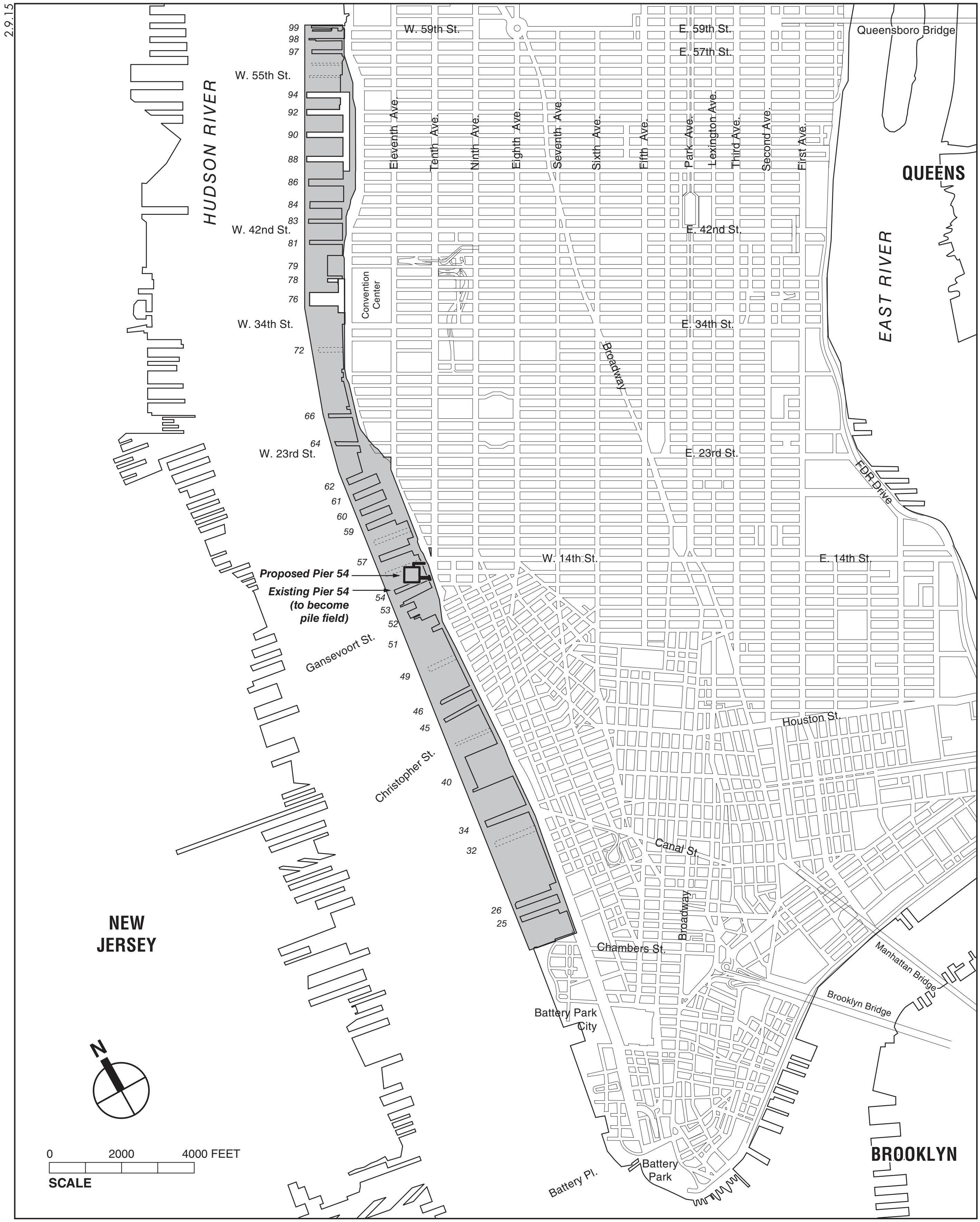
The project site is located at the existing Pier 54 and between the current Pier 54 footprint and the Pier 56 pile field and Pier 57 to the north, within Hudson River Park at approximately West 13th Street, and will be named "Pier55." The existing Pier 54 is located immediately south of the project site; to the east of the site is the Route 9A bikeway and roadway (see **Figure A-2**).

BACKGROUND

Pier 54 is part of the 550-acre Hudson River Park, which was the subject of an environmental review in the late 1990s (*Hudson River Park Final Environmental Impact Statement [FEIS]*, May 1998). Pier 54 is a designated "park use" pier within the Hudson River Park Act, Chapter 592 of the Laws of 1998 ("the Act"), as amended in 2013. Pursuant to the Act, among the uses permitted on "park use" piers are:

(i) Public park uses, including passive and active public open space uses;
(ii) Public recreation and entertainment, including the arts and performing arts, on open spaces; and
(iii) Facilities incidental to public access to, and use and enjoyment of park uses, such as concession stands, information stands, and comfort stations.

Since the Act was passed, HRPT has been constructing and operating Hudson River Park in accordance with the Act and the Park's General Project Plan.



Project Site

Hudson River Park

Project Location

Hudson River Park Pier 54 Redevelopment

Figure A-1

2/9/2015

Project Site

Hudson River Park
Future Pedestrian Platform Improvements
(not part of proposed project)

Hudson River Park

0 500 FEET

SCALE

Hudson River Park Pier 54 Redevelopment

Project Location
Figure A-2

Once owned by the Cunard-White Star Line, Pier 54 has a notable history. The Lusitania departed from Pier 54 on its maiden voyage, and the survivors from the Titanic returned to it. More recently, for more than a decade, Pier 54 has hosted a wide range of programs under HRPT's jurisdiction. In particular, Pier 54's central location has attracted a variety of concerts and festivals including a Marc Jacobs fashion show, the "Ashes and Snow" art installation, the Tony Hawk skateboard exhibition, the NYC Wine & Food Festival, the Gay Pride Dance, a regular program of summer movies, and the Jay-Z Carnival, some attracting up to 5,000 attendees or even more.

In 2013, HRPT was forced to close most of Pier 54 because of deteriorated pile and platform conditions, and is now seeking to redevelop it so it can resume use by the public. Approximately ¼ of the pier's original footprint remains open for public use. The general public can still access the portion of the pier that is still open, and a Learn to Bike program also makes use of the pier.

PROJECT DESIGN

Unlike other piers in Hudson River Park, the redeveloped Pier 54 would be square-shaped rather than rectangular and would contain dramatic rolling topography. The design concept is intended to create a captivating public landscape with opportunities for diverse park activities. Pier 54 would be designed as a natural landscape occupied by lawns, planted areas of shrubs and trees, and paved walking and seating areas. The elevations of the proposed pier platform would range from 8.0 feet Manhattan Borough Datum (MBD) (elevation 9.65 North American Vertical Datum of 1988 (NAVD88)) on the amphitheater floor (discussed below under "Program") along the western edge of the pier to approximately 62.0 feet MBD at the southwest corner, which would be the highest point on the redeveloped pier (see **Figures A-3 through A-5**). Elevating the piles and pier deck at the pier corners would introduce light beneath the pier, thereby enhancing opportunities for habitat. The vast majority of the proposed pier would be at elevation 15 feet MBD (elevation 16.65 feet NAVD88) or higher contributing to flood resilience. The pier would be supported on piles that would rise from the Hudson River and widen as they approach the pier platform to create the appearance of "pots" supporting the park landscape.

The rolling topography of the proposed project is intended to create a unique green park landscape that allows park visitors to visually engage with New York City and the surrounding river in new and unexpected ways. The vertical slopes created by the rolling topography add approximately a quarter acre more useable open space and area for programming than would be available with a flat pier structure. The additional space and sloped landscape allows for the separation of open space and programmed areas, creating spaces for relaxation, hillsides for exploration, and many and varied vantage points for walkers, joggers, and those sitting on the pier surface, whether as a regular park user or as someone watching a performance from one of the three unenclosed performance areas, discussed in more detail below. Outside the performance areas, the pier would be landscaped with a combination of grass, ornamental plantings, railings, decorative and safety lighting, pavement and other elements of park design. In addition, the proposed pier would have under-pier architectural lighting designed to highlight the substructure design. Lawns would provide opportunities for passive recreation consistent with other sections of Hudson River Park, including sunbathing and picnicking.

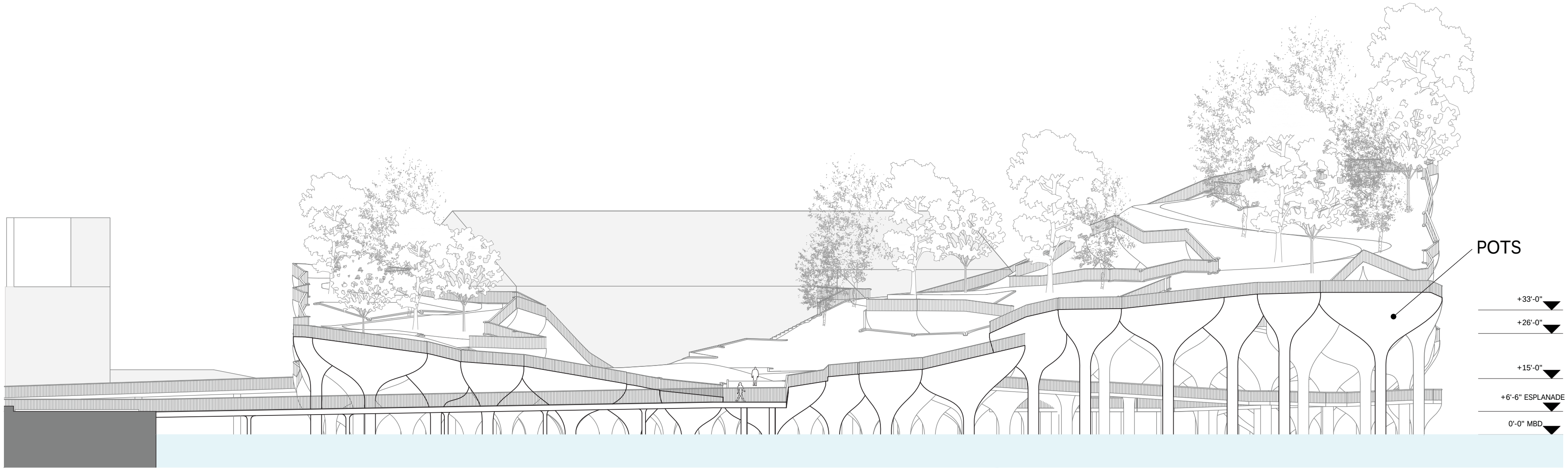
Landscaping for the proposed pier would be selected for tolerance to wind and salt exposure, and is being planned to provide four-season interest as well as a mix of sun and shade on the pier surface. The specifications of the soil composition on the pier would facilitate drainage. The topography would allow for greater variety in landscaping, and provide multiple vantage points

SOURCE: Heatherwick Studio

Draft Concept Design

General Plan

Figure A-3



01 NORTH ELEVATION

02 EAST ELEVATION

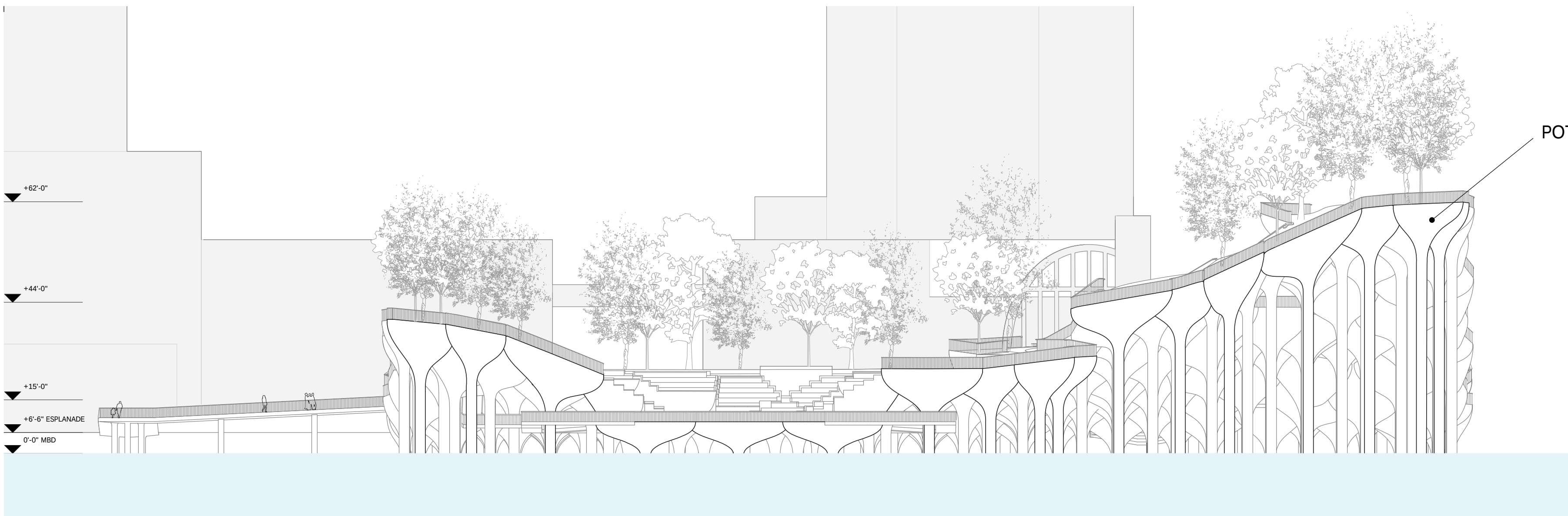
SOURCE: Heatherwick Studio

Draft Concept Design

North and East Elevations

Figure A-4

2.10.15



01 WEST ELEVATION

02 SOUTH ELEVATION

SOURCE: Heatherwick Studio

Draft Concept Design

West and South Elevations

Figure A-5

with views of the Hudson River, Hudson River Park and New York City. A drainage system located at some of the pier's lower elevations would collect water and divert it from paths and other paved areas. **Figures A-6 through A-10** provide illustrative views of the proposed project.

The proposed project's three performance areas would be integrated into the topography of the proposed pier. This integration would be most notable with the proposed amphitheater space. Rather than traditional walls and stairs to create the amphitheater space, the design would use the pier's topography. From approximately mid-pier, a lawn and paths would begin sloping upwards towards the west; after leveling off, the amphitheater structure would slope down again to reach the stage. This configuration would allow the entire amphitheater area to be integrated into the park landscape. The seated capacity of the amphitheater has been projected at approximately 750 patrons to provide a quality experience from every location within the theater.

The proposed square shape with rolling topography would provide two principal benefits. First, it would provide more design flexibility and possibilities for parkland and cultural programming, allowing for some programmed events to occur at the same time that visitors to the pier are enjoying passive recreational opportunities. Second, it would allow greater light below the pier deck thereby reducing shading of fish habitat within Hudson River Park's Estuarine Sanctuary. The size of the pier (2.4 acres, excluding the access ramps) would allow for the creation of both a high quality green landscape for park users, and several separate performance spaces, permitting multiple user experiences within the pier at the same time.

Historically, the configuration of events held on the long and narrow piers of Hudson River Park was for stages, dance floors, and other amenities to be located at the western end of the piers and audiences to the east, with a dedicated east-west emergency access lane. This less flexible configuration was driven by requirements for fire lanes and other provisions for emergency access and egress planning needed for large events. As a result, park visitors that are not attending the performance cannot functionally use the pier without being drawn into the performance. The square shape of the proposed pier would be more flexible, allowing for the creation of multiple performance areas of different types and sizes, and more green park space. This configuration would also allow greater ability for park goers to use surrounding landscaped areas when events are taking place at the amphitheater and southern lawn spaces.

PIER ORIENTATION AND ACCESS

As described above, the redeveloped pier would be located between the current Pier 54 footprint (which would be preserved as a pile field) and the Pier 56 pile field to the north. The pier would be oriented between these two pile fields in order to maximize the preservation of the pile fields for habitat and preserve the historical context of the waterfront. It would also parallel the Manhattan street grid, allowing for better pedestrian connections and continuous sight lines.

As shown in **Figures A-3 through A-5**, the redeveloped pier would have two access ramps that would connect to Hudson River Park's waterfront esplanade. The northern access ramp would extend northwest from the waterfront esplanade just south of West 14th Street and turn 90 degrees to the southwest to connect to the northern elevation of the pier. The southern access ramp would extend northwest from a balcony at the waterfront esplanade between Little West 12th Street and West 13th Street, pass underneath the surface of the pier, and connect to the pathway in the southeastern portion of the pier. In total, the access ramps would consist of approximately 13,000 gsf of overwater coverage.

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Bird's Eye View of the Proposed Project

Figure A-6

11.15.14

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Bird's Eye View of the Proposed Project

Figure A-7

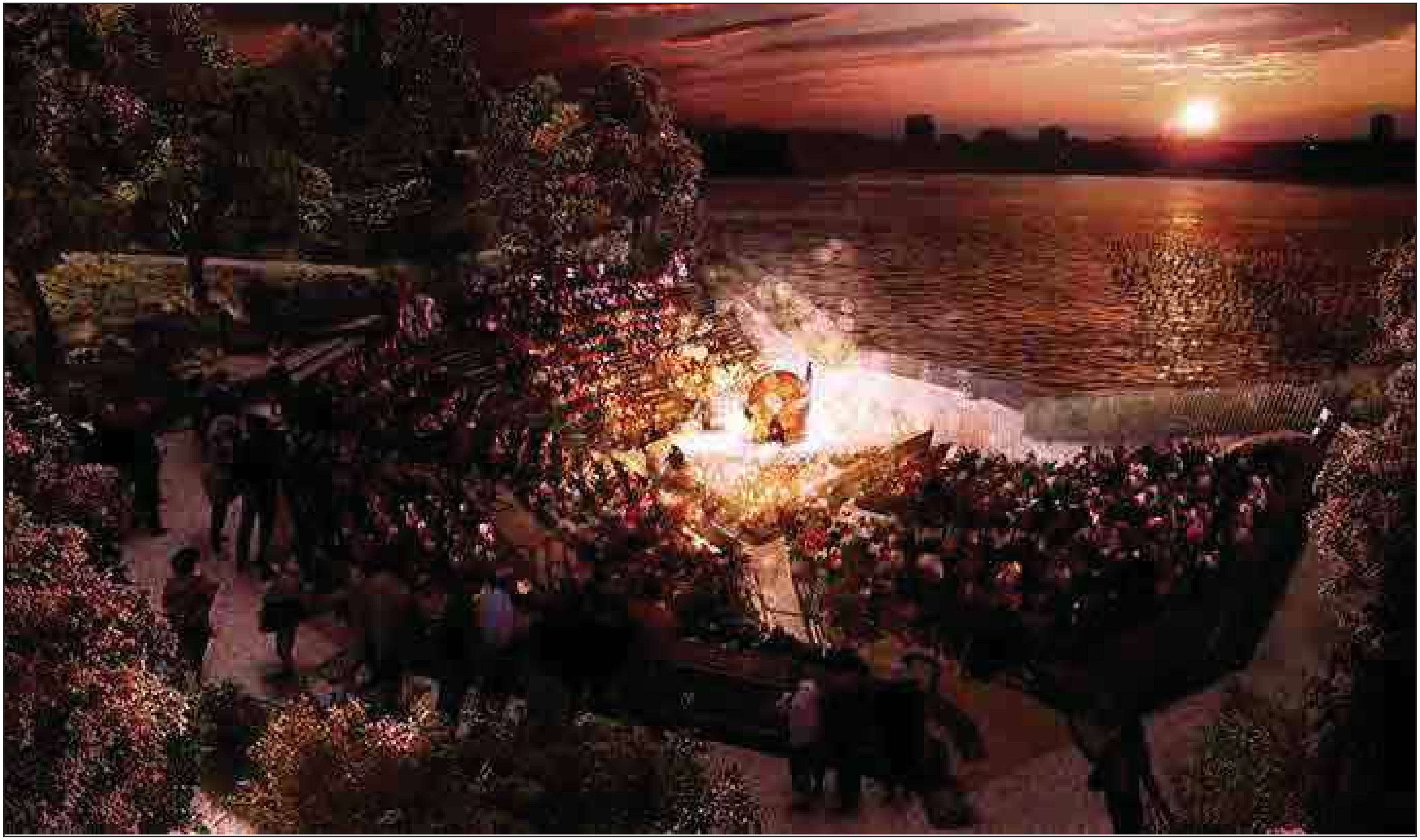
SOURCE: Heatherwick Studio

For Illustrative Purposes Only

View of the Proposed Project looking Northwest

Figure A-8

11.15.14



SOURCE: Heatherwick Studio

For Illustrative Purposes Only

View of the Proposed Amphitheater

Figure A-9

2.9.15

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

View of the Proposed Project and Existing Pier 54 Arch from the Esplanade

Figure A-10

The pier's two access ramps would connect to areas of the adjacent waterfront esplanade that are being improved in the future as part of the proposed Pier 54 Connector Project, which would be undertaken independent of the proposed project. HRPT has secured a federal grant through the Congestion Mitigation and Air Quality improvement (CMAQ) program for the Pier 54 Connector Project, subject to completion of federal environmental review. Improvements would include a widened overwater pedestrian platform, improvements to the Route 9A bikeway alignment, new lay-by area for a future public bus stop, and landscaping. As part of the Pier 54 Connector Project, the Pier 54 arch will be retained in its existing location. **Figure A-10** shows the retained Pier 54 arch in the future with the proposed project. The Pier 54 Connector Project would be substantially completed prior to the opening of the proposed project.

Access to Hudson River Park and the proposed Pier 54 would also be facilitated by another nearby independent project, the Route 9A West 13th Street Crosswalk Project, which would create an at-grade pedestrian crossing across Route 9A at West 13th Street. The proposed project and the locations of the Pier 54 Connector Project and the Route 9A West 13th Street Crosswalk Project are shown on **Figure A-11**.

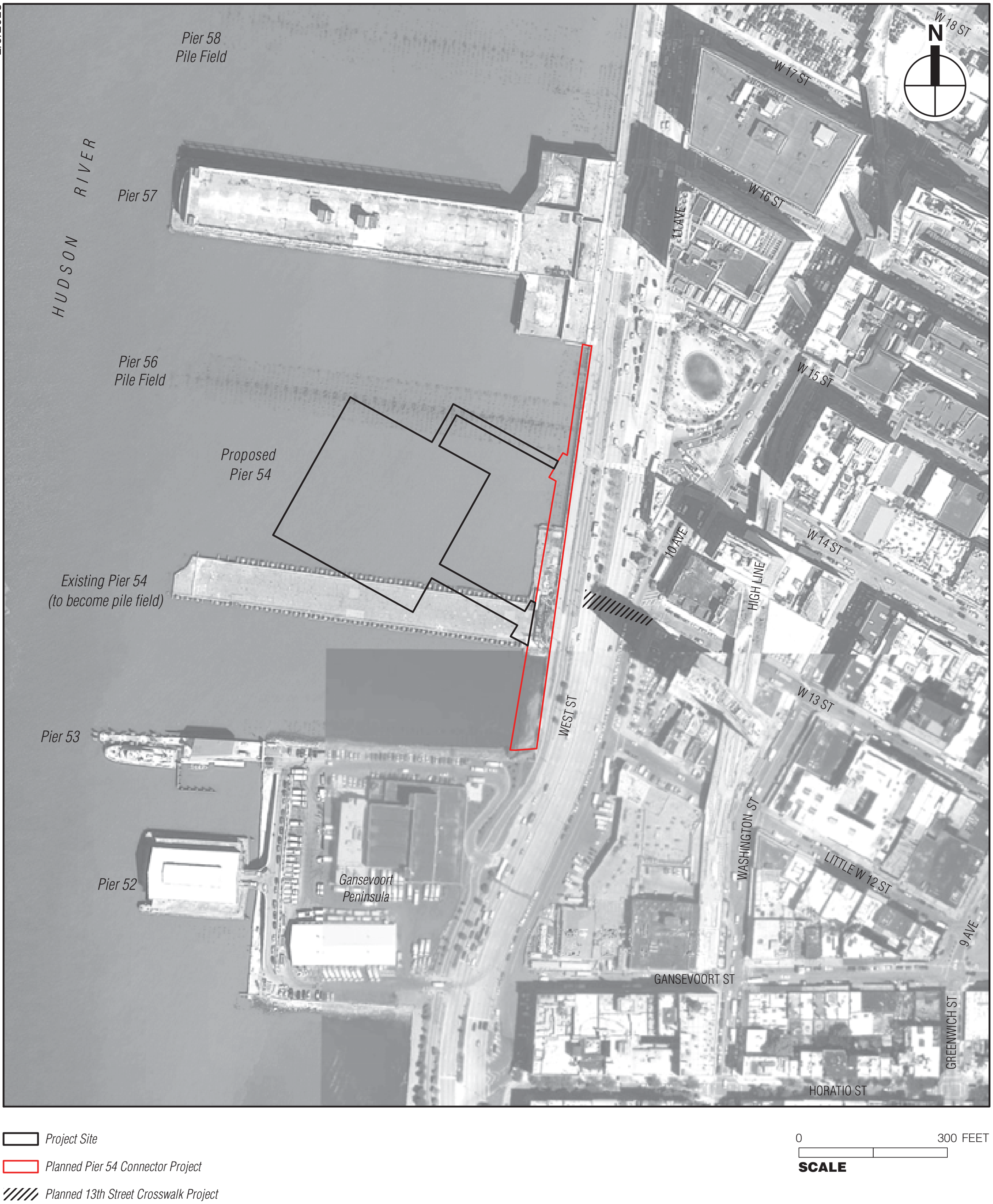
PROGRAM

The redeveloped Pier 54 including the access ramps would include approximately 117,000 gsf of public open space for use as both a general recreation and cultural event space capable of hosting programming for up to 5,000 attendees (the peak event for the proposed project). The proposed pier would be designed for regular park use but, as noted above, would also contain three unenclosed performance areas. The design of the performance areas would be integrated into the park landscape, and these areas would be used for general park use when not used for performances. These performance areas are described below.

AMPHITHEATER

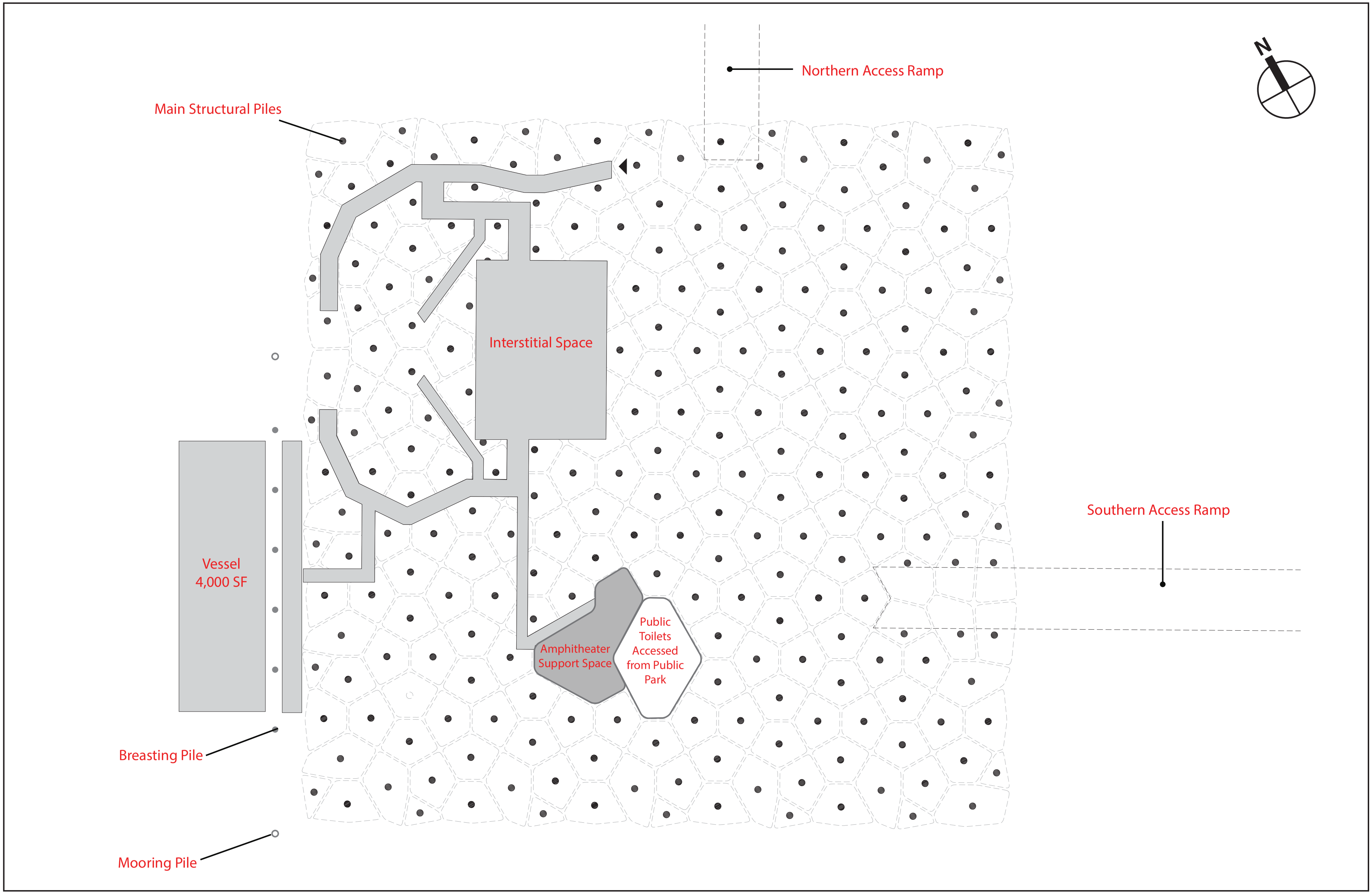
On the northwestern side of the pier, the pier would include an approximately 750-seat amphitheater. The amphitheater would be integrated into the rolling topography of the pier, allowing for raked seating. This style of seating, as well as the size of the amphitheater, would ensure quality equitable views from every angle.

The amphitheater would include theater-specific amenities including infrastructure to support lighting and sound equipment for performances. The amphitheater would be served by a support area, which would provide an area where actors, scenery, and props could be located backstage; it could also provide storage for equipment needed to care for the park. The amphitheater support area would be located within an interstitial space beneath a portion of the amphitheater and supported by a combination of piles and decking. The support area would be accessible from a ramp located toward the center of the pier; this ramp would also be used to meet Americans with Disabilities Act (ADA) requirements for theater audiences and actors. For a period not to exceed six month per year, a vessel measuring a maximum of 4,000 sf would moor along the northwestern edge of the pier, connecting to the interstitial space ramps (see **Figure A-12**). The vessel would provide additional support space (changing, shower and toilette facilities) required to meet the Actors Equity Association requirements for certain performances, allowing the pier to accommodate more diverse cultural programming with a larger number of performers while limiting the extent of permanent structures on the pier and maximizing usable green public space. The amphitheater would be screened by trees and shrubs to provide an environment that blends into the surrounding landscape. When not in use for performances, the seating areas



Location of Proposed Project, Pier 54 Connector Project, and Route 9A West 13th Street Crosswalk Project

Figure A-11



Draft Concept Design

Location of the Proposed Interstitial Space and Temporary Vessel

Figure A-12

provided by the amphitheater could be used by park patrons to watch the setting sun or otherwise relax.

OTHER PERFORMANCE AREAS

The pier would include two additional distinct, unenclosed areas where performances could occur:

- Southern lawn space. At the pier’s southern side, there would be a small area with a gently sloping lawn and potentially a small band shell that could, on occasion, provide informal seating for audiences of approximately 200 in addition to a comfortable place for regular park relaxation.
- Main space. The main space in the proposed project would be a large, flat zone on the northeastern portion of the redeveloped pier. The area would be large enough for a movable stage, generators and other front- and back-of-house elements needed to stage concerts and other productions. Depending on the nature of the event and its staging requirements, this area and its surrounding lawns and planted overlook areas could accommodate up to 5,000 attendees, with peak events scheduled infrequently.

The redeveloped Pier 54’s sloping topography would also allow a fourth type of programmed event, in which performers could use the pier landscape rather than only the designated spaces. In these instances, performers could use the pier’s higher elevation points in the southwestern portion of the pier as a performance location, while the audience would observe from the main space and hills below.

EVENT AND CULTURAL PROGRAMMING

Event and cultural programming on Pier 54 would be carefully curated to provide experiences that take advantage of the proposed pier’s setting and location. Together, the venues would host a variety of theater, music, dance, spoken word, film, talks, readings, educational events and activities. The amphitheater would be used primarily for events requiring or benefiting from fixed seating and unimpeded views. The southern lawn space would typically host small-scale events where a less formal setting is desirable. The main space would likely host other events and productions including Hudson River Park’s free outdoor movies and other programs, as well as occasional benefits for the pier or Hudson River Park overall.

Overall, a broad range of programming would occur at Pier 54’s proposed performance areas. During some large events, or during set-up and breakdown for such events, the need to provide for clear paths for ingress and egress as well as ensure crowd control and maintain public safety may restrict use of some or all of the proposed pier within appropriate limitations designed to minimize the frequency and extent of closure. For peak or ticketed events, access to the event area would be limited as is typically done at other large events in Hudson River Park and would also occur in the No Action condition. Otherwise, the remainder of the pier would generally be available for public recreation use at times that events are occurring in the performance areas.

The proposed pier would include electric power and water connections to support the proposed park and event uses, and would include a sanitary sewage connection and permanent bathrooms to serve the public and amphitheater events. Sanitary sewage services would be supplemented with portable toilets as necessary, consistent with current park operations. The electric power connection would be necessary for sound and lighting needs at the amphitheater, and may provide a connection for temporary sound and lighting equipment at the main space. In order to accommodate the proposed project's electrical load requirements, transformers would be constructed on the Gansevoort Peninsula south of the proposed pier and connections would be provided beneath the esplanade as is done throughout the park.

IN-WATER CONSTRUCTION

The proposed project would require a number of in-water construction activities related to the creation of the pier platform and the supporting piles. Some aspects of the work to be conducted at Pier 54 were assessed in the 1998 FEIS, and permits and subsequent renewals were issued to HRPT. A permit was previously issued in 2005 for an earlier proposal for the pier in which the deck was to be rebuilt in its current footprint.

As now proposed, the redeveloped Pier 54 platform and access ramps would be supported on new piles installed in the river. **Figure A-13** shows a preliminary pile layout plan for the proposed project. The piles would consist of up to 264 hollow cylindrical concrete main structural piles under the pier platform, each 36 inches in diameter; up to 44 access ramp piles, each 24 inches square; up to 9 piles for the southern balcony, each 24 inches square; up to 56 other structural piles, each 20 or 24 inches square, to support the amphitheater support space beneath the pier; two 24-inch diameter concrete-filled steel mooring piles and four 36-inch diameter concrete-filled steel pipe breasting piles with floating donut fender to moor the up to 4,000-sf temporary support vessel; and a separate row of eight fender pile clusters (dolphin piles) to protect the structure. Each of the nine fendering piles would be composed of 19 piles: three 14-inch steel piles and sixteen 12-inch timber piles. Pile driving would be completed outside of the November 1 to April 30 window in which pile driving is prohibited by the USACE and NYSDEC permits issued for Hudson River Park. As discussed in more detail in Attachment F, "Natural Resources," pile driving is anticipated to take about 15 minutes per pile for the concrete and steel piles, with typically up to three 36 inch piles or up to six 24 inch piles driven per day, or some combination of the two.

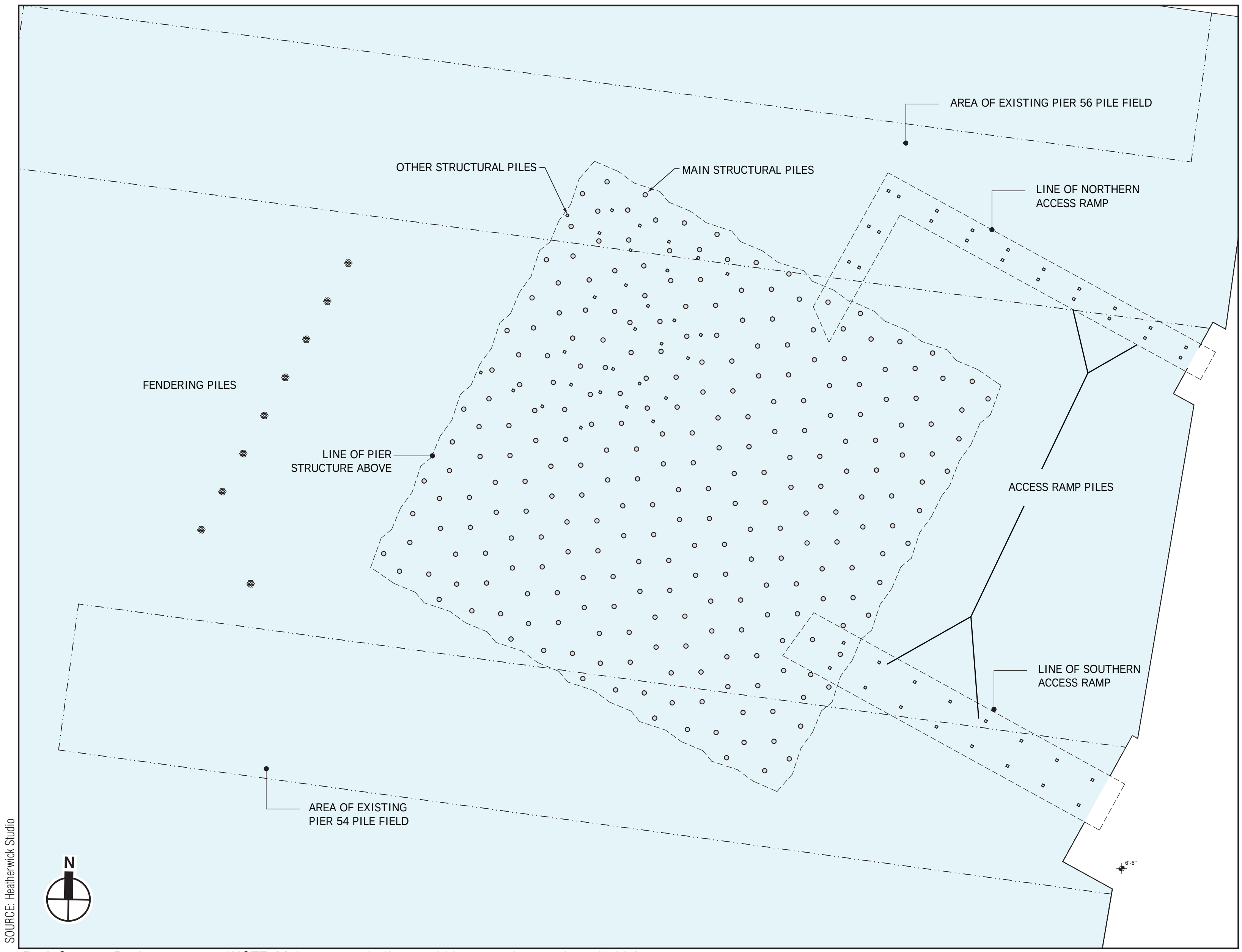
STORMWATER MANAGEMENT AND SLOPE STABILITY MEASURES

Slope stabilization for the proposed pier would be accomplished through a variety of strategies based on slope angle and anticipated foot traffic. Underdrains would collect water from the pier deck and direct it to discharge points, as described below. On slopes up to 30 degrees, stabilization would rely on plant roots and mulch. On slopes greater than 30 degrees, soils would be stabilized through a combination of geofibers or non-degradable mesh fabric, densely rooted shrubs, and ground cover plants.

Stormwater management measures would be incorporated in the pier design to carry runoff to the Hudson River. Prior to discharge, stormwater would be filtered through plant roots. By creating a pier with planted areas, the redeveloped pier would result in a reduction in runoff rates to the Hudson River during rain events and an improvement in runoff water quality as compared with existing conditions and the No Action condition in which runoff from the Pier 54 platform would discharge directly to the Hudson River. By reducing runoff rates, the proposed project has the potential to reduce the concentration of pollutants entering the river.

RESILIENCY TO FLOODING AND SEA LEVEL RISE

The proposed project has been designed to account for its location within a floodplain and anticipated sea level rise. As noted above, the vast majority of the proposed pier's platform would be at elevation 15 feet MBD (elevation 16.65 feet NAVD88) or higher; only the



Draft Concept Design **NOTE: Main structural piles would be spaced approximately 20 feet apart on center*

Proposed Pile Locations

Figure A-13

amphitheater support space and the stage area of the western amphitheater would be below the current 100-year flood elevation and the projected change in the flood elevation with sea level rise (see Attachment F, "Natural Resources" for further discussion for floodplains and sea level rise). Furthermore, critical infrastructure such as the pier structures, electrical equipment, etc. would be located above these flood elevations or otherwise dry- or wet-flood-proofed and the proposed project would be designed to withstand flooding. The plant selection, sand based soils and irrigation system would be designed to recover from flooding.

PROJECT SCHEDULE

The proposed project would be completed over an approximately 37-month period. It is anticipated that construction of the proposed pier would begin in 2016 and be complete by 2019.

C. PROPOSED ACTIONS

The proposed project would require the following discretionary actions:

- HRPT approval of lease terms and amendment to the Park's existing General Project Plan.

  Approval of this action is considered a "significant action" in the Hudson River Park Act, and therefore requires a public hearing and comment period prior to any vote.
- Modifications to the previously issued NYSDEC permit under Article 15 of the ECL Protection of Waters, and Water Quality Certification under Section 401 of the Clean Water Act.
- Modifications to the previously issued USACE permits under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for construction of the proposed project within the Hudson River.

In addition, the proposed project would require a modification to the 1999 waterfront certification by the chairperson of the City Planning Commission for Hudson River Park under waterfront zoning.

D. PURPOSE AND NEED

Consistent with the Hudson River Park Act, the purpose of the proposed Pier 54 project is to utilize the Hudson River waterfront for the public benefit, making it an asset for the City, State, and the region. The Pier 54 project would reestablish public access to the waterfront at this location. It would provide additional public open space resources and cultural space within Hudson River Park in a manner that allows for greater functionality and programming flexibility while minimizing potential impacts to resources of the Hudson River and maintaining consistency with the Hudson River Park Estuarine Sanctuary Management Plan. The design of the proposed pier would provide a second means of egress from the pier, and the additional space and sloped landscape would allow for the separation of open space and programmed areas, creating spaces for relaxation and cultural events.

The Pier 54 project would also have other benefits. With most of the funding for the proposed project being provided by a private donation, the open space and cultural programming that would be created at this location within the Park would allow public funding to be applied to other park locations, allowing more previously approved park elements to be created and maintained. The proposed project would also provide greater resiliency within this segment of the Park, reduce the area of aquatic habitat affected by shading within the Park, and establish pile field habitat within the existing Pier 54 footprint.

E. ENVIRONMENTAL ANALYSES

INTRODUCTION TO THE ANALYSIS

The purpose of this analysis is to examine the environmental impacts of the proposed redevelopment of Pier 54 ("the proposed project"). As described above, the proposed project is located within Hudson River Park. Pier 54 is a designated "park use" pier within the Hudson River Park Act.

Environmental impacts associated with the development of the Hudson River Park were analyzed by the Empire State Development Corporation (ESDC) pursuant to SEQRA and CEQR in the FEIS, which was certified as complete in May 1998. The FEIS evaluated the full array of potential impacts resulting from the development of Hudson River Park, including traffic, noise, air quality, natural resources, and cultural resources. The 1998 FEIS considered the renovation of Pier 54 for public park use, but did not analyze any changes to the pier footprint. As the rest of the park is largely complete and operational, and would not be altered by the proposed project, this analysis examines the proposed project as an independent action.

ANALYSIS FRAMEWORK

This environmental review has been prepared to satisfy the requirements of SEQRA. The *CEQR Technical Manual* generally serves as a guide with respect to methodologies and impact criteria for evaluating the proposed project's potential effects on the various environmental areas of analysis.

The EAF analyzes the proposed project's potential for significant adverse environmental impacts. Because the proposed project is expected to be operational in 2019, its environmental setting is not the current environment, but that of the future. Therefore, the technical analyses and consideration of alternatives characterize current conditions and forecast these conditions to 2019, the project's analysis year, for the purpose of determining impacts. The EAF and supplemental studies provide a description of "Existing Conditions," and assessments of future conditions without the proposed project ("the No Action condition") and with the proposed project ("the With Action condition").

NO ACTION CONDITION

In all technical areas, the No Action condition assumes that none of the discretionary actions are approved. In this case, Pier 54 would be reconstructed in accordance with the authorizations received from NYSDEC and USACE in 2005, and resume general park and event uses, consistent with its prior functions. Unlike the proposed project, the rebuilt pier would be rectangular in shape, similar to other piers in Hudson River Park, and its topography would be flat. The rebuilt pier would be approximately 84,300 square feet and would include a row of planters and seating. It would be supported on 220 new 24 inch square concrete piles in a 30 foot by 15 foot grid and would also have new fender piles. Many of the 3,471 existing timber piles under the existing Pier 54 would remain in place in accordance with existing permit conditions but would not provide structural support to the rebuilt pier. In the No Action condition, the rebuilt pier would host a variety of events of a similar size as the proposed project, and would have a similar peak event capacity of approximately 5,000 attendees. **Figure A-14** shows the deck plan for the rebuilt pier in the No Action condition and **Figure A-15** shows the pile plan.

The analysis of the No Action condition accounts for other future developments as identified in Attachment B, “Land Use, Zoning, and Public Policy” that would occur independent of the proposed project. In each technical area of the analysis, the With Action condition is compared with the No Action condition as the basis for assessing impacts.

PROJECT DESIGN ALTERNATIVES

The proposed project was developed through a design process that assessed alternatives to various aspects of the design. These design alternatives, and the reasons they were not considered for further evaluation, are described below.

Smaller Pier Footprint

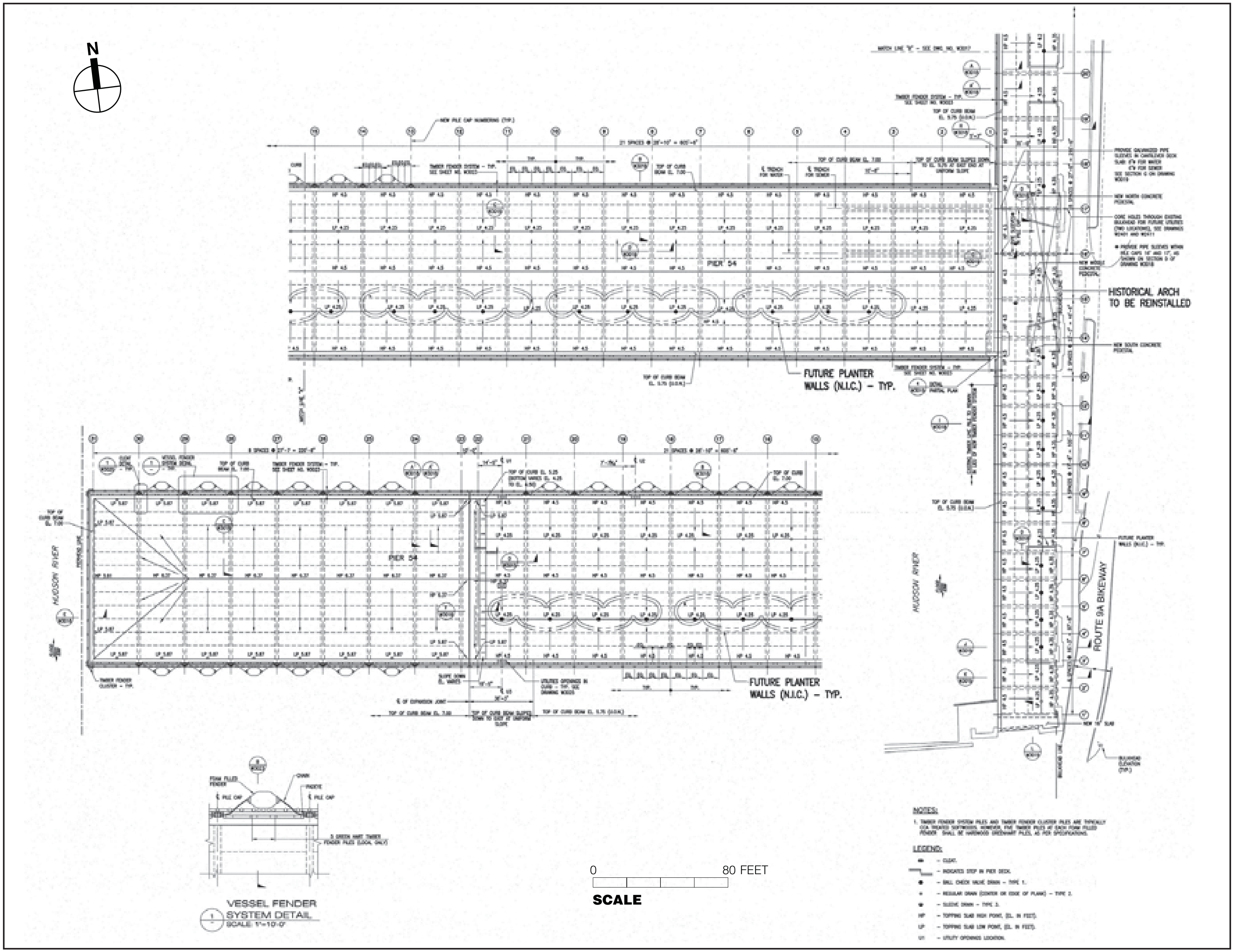
The proposed project is a 320-foot by 320-foot square pier with an overwater footprint of approximately 2.7 acres including the access ramps. The pier size was selected through an iterative design process that considered first a rectangular pier typical of the size and shape of others within Hudson River Park, similar to the original 1.9-acre Pier 54. Because the Trust historically hosted park events like movies and concerts for 5,000 attendees on Pier 54, any alternative pier design needed to be able to accommodate a crowd of at least this capacity. Additionally, unlike the No Build pier design, the Trust established the goals of 1) providing for a secondary means of egress during event conditions especially; 2) allowing for multiple user experiences within the pier at the same time (e.g., the separation of open space and programmed areas); and 3) providing for a diversity of performance environments (rather than the in-line single rectangular stage and audience area required by the typical rectangular pier configuration). The proposed pier size, while slightly larger than the original 1.9-acre Pier 54, was the minimum footprint found that would allow for all of these goals to be achieved. For this reason, a pier smaller in size that the proposed 2.4-acre pier (excluding the access ramps) was not considered to fulfill the project’s purpose and need and is therefore not practicable.

Alternative Pier Location

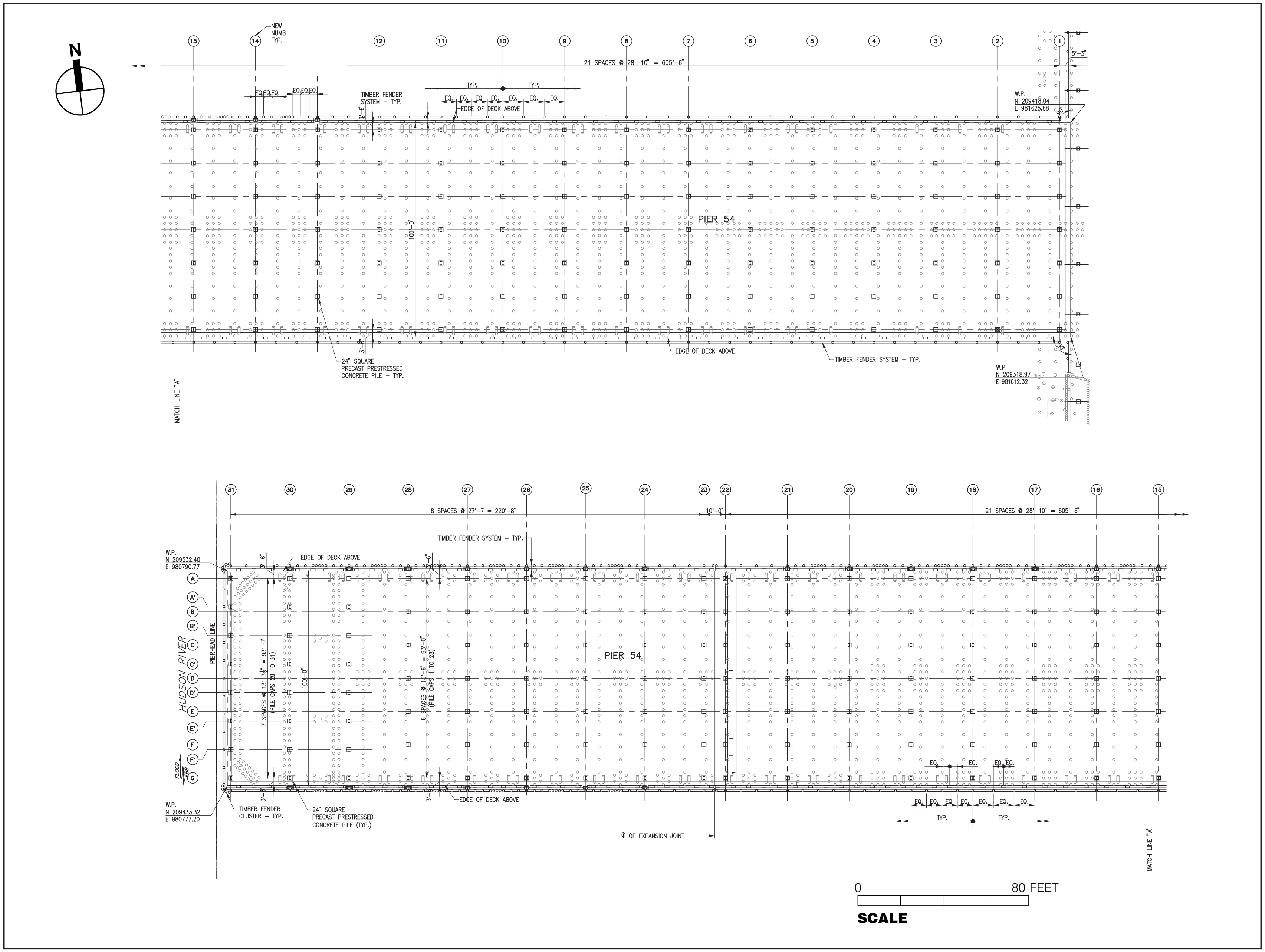
During the conceptual design process, an option was considered that would have located the pier further to the south, with a portion of the pier within the existing Pier 54 footprint. This option was rejected because it would have resulted in view corridor obstructions, would have been closer to a possible future Gansevoort Peninsula Marine Transfer Station, and would not have provided as desirable a connection to public from West 14th Street as the proposed project. For this reason, locating the pier closer to its existing footprint was not considered to fulfill the project’s purpose and need and is therefore not practicable.

Alternative Pier Orientation

Another alternative was considered with respect to the location of the pier’s high point. Among the goals of the project was to design the pier in such a way that most of it would be outside of the floodplain. Once the decision was made to elevate the pier, it became clear that by rotating the pier such that its high point was due south would cast less shadow on aquatic habitats of the Hudson River. Accordingly, even with a larger footprint, there would be little change in the incremental shadow on the river. For these reasons, there was no benefit to considering an alternative pier orientation.



No Action Condition - Approved Pier 54 Deck Plan



No Action Condition - Approved Pier 54 Pile Plan

Figure A-15

Pile Support Bracing Design Alternative

As an alternative to the pile design of the proposed project where “pots” at the top of the 36-inch-diameter concrete piles support the landscaping, an alternative design was considered that supported the deck using curved pile caps on solid piles. This Pile Support Bracing Design Alternative would provide the same size and dimensions of the pier platform as the Proposed Project (a 320-by-320-foot platform). However, this alternative would use an alternative construction method of smaller 24-inch diameter solid pier support piles with curved pile caps to support the pier platform. A total of 629 piles would be required to support the weight of the proposed pier platform. To reinforce the piles to support the lateral loads of the pier, this alternative would require bracing of cross-members within the tidal zone in two directions. The volume of structure that would be placed within the Hudson River below Mean High Water (MHW) was estimated at about 5,400 cubic yards. Because even this amount of bracing likely would not restrain the pier laterally, a slab spanning the bracing beams would also be required, creating a solid deck at mid-tide elevation.

This alternative would not have resulted in the placement of flowable concrete below MHW. However, this alternative would substantially increase the amount of structure below MHW which would have the potential for adversely affecting the water circulation pattern in the vicinity of the pier, would pose concerns with respect to constructability (use of precast members for the pier platform would not be an option; instead concrete would have to be cast in-place over the river), would be more costly than the Proposed Project, and would lengthen the in-water construction period. For all these reasons, it was not considered practicable.

Use of Solid 36-inch Diameter Pier Support Piles

The alternative of using a solid pile to support the pier, which would not have resulted in the discharge of flowable concrete below MHW to connect the “pots” to the piles, was evaluated as an alternative to the pile design of the proposed project. The allowable load limit for a 36-inch diameter pile is approximately 250 tons. To support the proposed pier structure, the piles must support a load that has 3 components: DL (dead load or the weight of the structure), SDL (superimposed dead load or the weight of soil, trees, pavement, etc.), and LL (live load or the weight of people, vehicles, etc.). With solid piles, the DL would increase, approximately 30 tons per pile. Because there is a limit on the load that a pile can support, increase in the DL would have to be compensated by a decrease in some other load. Since the LL cannot be decreased, the SDL weight would have to be decreased. The main contributor to SDL is the weight of the horticultural soil. An average tree requires a minimum of 3 feet of soil depth to grow and thrive. Reducing this thickness would have required elimination of most trees on the pier. Additionally, the solid 36-inch diameter piles are heavier than hollow piles (almost double the weight) and subsequently are harder to lift and handle. This would result in the need for larger pile driving equipment, a slower pile installation pace, and an increase in the pile driving duration. For these reasons, this alternative was not considered practicable

Alternative without the Amphitheater Support Vessel

As discussed above, the amphitheater that would be developed as part of the proposed project would include theater-specific amenities including infrastructure to support lighting and sound equipment for performances. It would be served by a support area, which would provide an area where actors, scenery, and props could be located backstage; it could also provide storage for equipment needed to care for the park. The amphitheater support area would be located within an interstitial space beneath a portion of the amphitheater and supported by a combination of piles and decking. The support area would be accessible from a ramp located toward the center of the pier; this ramp would also be used to meet ADA requirements for theater audiences and actors. For a period not to exceed six month per year, a 4,000-sf vessel would moor along the northwestern edge of the pier, connecting to the interstitial space ramps. The vessel would provide additional support space (changing, shower and toilette facilities) required to meet the Actors Equity Association requirements for performances, allowing the pier to accommodate cultural programming while limiting the extent of permanent structures on the pier and maximizing usable green public space. Under this alternative, all of the additional support space that would be required to meet Actors Equity Association requirements would be provided on the surface of the pier, or accommodated as much as possible within the amphitheater support space. Providing the additional support space on the pier surface would require a 4,000-square-foot structure to be constructed on the main space of the pier, resulting in a permanent loss of open space area within the structure footprint, for an activity that would only occur during the performance season and may not occur at all in a given year. In addition to resulting in a loss of open space, such a structure would also compromise the visual integrity and beauty of the park as designed. Accommodating the additional amphitheater support space only within the interstitial space would limit the artistic programming to very small productions utilizing only a handful of professional actors or be forced to hire non-union actors in order to avoid compromising union regulations. This would result in producing work far below the highest standard demanded for this venue. For these reasons the alternative of not providing additional support by using an amphitheater support vessel was not considered practicable.

IMPACT ASSESSMENT

LAND USE, ZONING AND PUBLIC POLICY

See Attachment B, "Land Use, Zoning, and Public Policy."

SOCIOECONOMIC CONDITIONS

According to the *CEQR Technical Manual*, a socioeconomic assessment should be conducted if an action may reasonably be expected to create substantial socioeconomic changes within the area affected by the action that would not occur in the absence of the action. Actions that would trigger a CEQR analysis include the following:

- Direct displacement of 500 or more residents or more than 100 employees.
- Direct displacement of a business that is uniquely significant because its products or services are dependent on its location; it is the subject of other regulations or publicly adopted plans aimed at its preservation because of its type or location; or it serves a population that is uniquely dependent on its services, in its particular location.
- The development of 200 residential units or more or 200,000 square feet or more of commercial use that is markedly different from existing uses, development, and activities in the neighborhood. This type of development may lead to indirect residential or business displacement, respectively.
- The development of 200,000 square feet or more of retail on a single development site, creating the potential to draw a substantial amount of sales from existing businesses within the study area. This type of development may lead to indirect business displacement due to market saturation.

- Impacts on a specific industry; for example, if a substantial number of residents or workers depend on the goods or services provided by the specific affected business, or if it would result in the loss or diminution of a certain product or service that is important within the City.

The proposed project would not result in the direct displacement of any residents or businesses, nor would it result in a net increase of more than 200,000 square feet of commercial development or more than 200 residential units, the CEQR thresholds for projects that may have the potential to lead to indirect business or indirect residential displacement. Therefore, the proposed project would not result in any significant adverse impacts on socioeconomic conditions, and further analysis is not warranted.

COMMUNITY FACILITIES

The proposed project would not displace any community facilities. Therefore, the proposed project would not result in any significant direct effects on community facilities and services. As the proposed project would not generate any new residents, it would not increase the demand on public schools, libraries, hospitals, child care centers, or police and fire protection. Needs for community services at the pier would be similar in both the No Action and With Action conditions, as in both cases the pier would be used for public recreation and events. Therefore, the proposed project would not result in significant indirect effects on community facilities and services, and further analysis is not warranted.

OPEN SPACE

According to the *CEQR Technical Manual*, an open space assessment is typically conducted if an action would result in the physical loss of public open space or generate a number of new residents or workers sufficient to noticeably diminish the ability of an area's open space to serve the existing or future population. The proposed project would not result in the loss of public open space, but rather would result in the redevelopment of Pier 54 as a public park pier for use as both a general recreation and cultural space. It would provide a distinctive and visually dramatic new public pier in the park, and would allow the pier to resume its use as an important public recreational facility. The proposed project would provide approximately 0.8 acres more usable open space than the No Action condition because of its slightly larger size and topography and would also create a more varied park landscape that would provide for spaces for relaxation, hillsides for exploration, and many and varied vantage points for walkers, joggers, and those sitting on the pier surface.

The proposed project would not generate any new residents and would not generate workers of a scale that would result in an exceedance of the threshold specified in the *CEQR Technical Manual*. In both conditions the pier would be used for public recreation and a range of cultural events. The proposed project would be expected to result in greater visitation to the pier than the No Action condition due to the proposed project's distinctive park landscape as well as more frequent programming made possible by the design and configuration of the proposed project. While these visitors would be attracted to the pier by its high-quality design, they would not be expected to create a similar increase in utilization of open space at other locations within Hudson River Park. Additional visitors to Hudson River Park, a major regional park that serves millions of visitors per year, would not in any event be expected to result in any significant adverse impacts to open space. Overall, no further analysis is warranted, and the proposed project would not result in any significant adverse impacts to open space.

SHADOWS

See Attachment C, "Shadows."

HISTORIC AND CULTURAL RESOURCES

See Attachment D, "Historic and Cultural Resources."

URBAN DESIGN AND VISUAL RESOURCES

See Attachment E, "Urban Design and Visual Resources."

NATURAL RESOURCES

See Attachment F, "Natural Resources."

HAZARDOUS MATERIALS

As the proposed project would not involve hazardous subsurface disturbance of any upland areas, it would not have the potential to increase the exposure of people or the environment to hazardous materials. At the pier, regulatory requirements associated with disturbing hazardous materials in or on existing buildings or structures (e.g., asbestos containing materials or lead-based paint) would be followed. Therefore, the proposed project would not be expected to result in any significant adverse impacts due to hazardous materials. In-water sediment disturbing activities associated with the proposed project are addressed in Attachment F, "Natural Resources."

WATER AND SEWER INFRASTRUCTURE

The *CEQR Technical Manual* states that a preliminary infrastructure analysis for water supply is required if a project would result in a demand for water of more than one million gallons per day or if the project is located in an area that experiences low water pressure (such as the Rockaway Peninsula and Coney Island). The proposed project would not meet either of these thresholds; therefore, no further analysis of water supply is required.

The *CEQR Technical Manual* also provides guidelines for when a preliminary infrastructure analysis is required for wastewater and stormwater conveyance. In general, a preliminary infrastructure analysis is warranted for projects that greatly increase density, are located in an area of concern (such as the Jamaica Bay watershed or other sensitive drainage areas), or substantially increase impervious surfaces. As noted above, the proposed project would include a sanitary sewage connection and permanent bathrooms to serve the public and amphitheater events. However, the proposed project would not greatly increase population density, would not be located in a sensitive drainage area, or increase impervious surfaces compared to the No Action condition. Further, as described above, by creating a pier with planted areas, the redeveloped pier would result in a reduction in runoff rates to the Hudson River during rain events and an improvement in runoff water quality as compared with existing conditions and the No Action condition in which runoff from the Pier 54 platform would discharge directly to the Hudson River. By reducing runoff rates, the proposed pier has the potential to reduce the concentration of pollutants entering the river. With the proposed project, precipitation that falls on planted areas would be filtered through plant roots and through a sand-based soil medium, improving the quality of the stormwater prior to discharge to the river. "Pots" that contain planting soil would have spouts to release water collected within these areas. In instances where a path or other physical obstruction impedes free flow of water down slopes, underdrains would collect this water and direct it to a collection and discharge point through the pier platform. The large gently sloped lawn area would have an under-drainage system to convey water to discharge points through the pier deck. Therefore, a preliminary infrastructure analysis is not required and the proposed project would not result in any significant adverse impacts to water and sewer infrastructure.

SOLID WASTE AND SANITATION SERVICES

The *CEQR Technical Manual* states that few projects generate the substantial amounts of solid waste (50 tons a week or more) that would result in a significant adverse impact. The proposed project would not generate any new residents. Further, it would not generate workers and visitors of a scale that would result in an exceedance of the threshold specified in the *CEQR Technical Manual*. Therefore the proposed project would not require any detailed analysis of solid waste and sanitation.

ENERGY

According to the *CEQR Technical Manual*, a detailed assessment of energy impacts would be limited to actions that could significantly affect the transmission or generation of energy or that generate substantial consumption of energy. The proposed project is not expected to generate a significant demand for energy; as described above, the pier would be served by new transformers on the Gansevoort Peninsula. Therefore, the proposed project would not result in significant adverse impacts to the consumption or supply of energy, and no further analysis is required.

TRANSPORTATION

With both the No Action condition and the proposed project, the pier would resume its use for public recreation and cultural programming. With respect to event conditions, the level of peak activity would be similar to that which occurred previously at the pier, and which occurs at other park events. Therefore, for peak event conditions, the proposed project would not add new vehicle, pedestrian, or transit trips to the area, and there would be no significant adverse impacts on traffic and parking or transit and pedestrians.

However, when there are no events, in light of the notable design of the proposed project, Pier 54 may become a specific attraction within Hudson River Park, generating additional trips beyond that of a rebuilt pier in the No Action condition. In recognition of that fact and to conservatively estimate incremental weekday and weekend daily visitation levels attributable to the proposed project, annual visitation levels were examined at the High Line Park, a nearby very successful public space with a high intensity of use throughout the year.

Daily estimates at the proposed project were created by utilizing weekday and weekend visitation levels at the High Line and then adjusting those attendance volumes for the relative size of Pier 54 compared to the High Line along with a factor to account for seasonal variation. The incremental difference in attendance between the No Action Pier 54 and the proposed project was estimated as approximately 33 percent of the adjusted High Line daily attendance.

Table A-1 presents the trip generation factors applied to the estimate of the incremental increase in visitation attributable to the to the proposed Pier 54 project. These trip generation factors were based on the 2014 *CEQR Technical Manual* and the *Pier 57 Redevelopment Project EIS.* The projected attendance forecast conservatively does not take any credit for linked trips.

Table A-1
Trip Generation Factors

	Weekday			Weekend
Daily Visitors		6,681[1]		9,420[2]
Baseline Credit[3]		66%		66%
Daily Incremental Visitors[3]		2,205		3,108
Trips per Incremental Visitor		2.0		2.0
Temporal [4]	AM	MD	PM	MD
Distribution	3%	5%	11%	6%
In[5]	55%	50%	56%	55%
Out[5]	45%	50%	44%	45%
Modal Split[5]				
Auto		5%		5%
Taxi		1%		1%
Subway		3%		3%
Bus		4%		4%
Walk		87%		87%
Total		100%		100%
Vehicle Occupancy[5]				
Auto		2.80		2.80
Taxi		2.80		2.80

Sources/Notes:
(1) Based on 2013 attendance of the High Line Park and adjusted based on the size of the High Line (approximately five acres in the portion south of West 30th Street) compared to the proposed Pier 54 (approximately 2.4 acres)
(2) Based on relationship between weekday and Saturday daily trips for active park presented in 2014 *CEQR Technical Manual*
(3) Assumes 1/3 of visitor increment attributable to the proposed project
(4) 2014 *CEQR Technical Manual*
(5) *Pier 57 Redevelopment Project FEIS (February 2013)*

As presented in **Table A-2**, the trips attributed to the design of Pier 54 would not exceed any of the 2014 *CEQR Technical Manual* Screening Level 1[1] thresholds requiring further analysis except for pedestrian trips during the PM and Saturday peak hours, which exceeded the 200 peak hour pedestrian trip threshold. However, assuming a roughly even directional distribution, once the pedestrian trips are assigned to the adjacent pedestrian facilities (a Screening Level 2[2] assessment) none of the locations would experience an increase of 200 or more pedestrian trips due to the project. Therefore, no further analysis would be required and there would be no significant adverse impacts on traffic and parking or transit and pedestrians.

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[1] A Screening Level 1 assessment determines the number of peak-hour person and vehicle trips expected to be generated by the proposed project. If the proposed project would result in fewer than 50 peak-hour vehicle trips and fewer than 200 peak-hour transit or pedestrian trips, further quantified analyses are not warranted and the proposed project is unlikely to result in significant adverse traffic, transit, pedestrian, and parking impacts

[2] A Screening Level 2 assessment is undertaken if the proposed project would result in more than 50 peak-hour vehicle trips and more than 200 peak-hour transit or pedestrian trips. For Level 2 Screening assessment, project-generated trips are assigned to specific intersections, transit routes and pedestrian elements. If the result of this assessment determines that the proposed project would generate more than 50 peak-hour vehicle trips per intersection, more than 200 transit trips per route/station element, or more than 200 pedestrian trips per pedestrian element, further quantified analyses would be warranted to assess the potential impacts on transportation conditions.

Table A-2
Trip Generation Summary

Peak Hour	In/Out	Person Trips: Auto	Taxi	Subway	Bus	Walk	Total	Vehicle Trips: Auto	Taxi	Total
AM	In	4	1	2	3	63	**73**	1	1	**2**
	Out	3	1	2	2	52	**60**	1	1	**2**
	Total	7	2	4	5	115	**133**	2	2	**4**
Midday	In	6	1	3	4	96	**110**	2	1	**3**
	Out	6	1	3	4	96	**110**	2	1	**3**
	Total	12	2	6	8	192	**220**	4	2	**6**
PM	In	14	3	8	11	236	**272**	5	1	**6**
	Out	11	2	6	9	186	**214**	4	1	**5**
	Total	25	5	14	20	422	**486**	9	2	**11**
Saturday	In	10	2	6	8	178	**204**	4	1	**5**
	Out	8	2	5	7	146	**168**	3	1	**4**
	Total	18	4	11	15	324	**372**	7	2	**9**

AIR QUALITY

Air quality impacts can be either direct or indirect. Direct impacts result from emissions generated by stationary sources at the project site, such as emissions from on-site fuel combustion for heating and hot water systems. Indirect impacts are those caused by emissions from nearby existing stationary sources (impacts on the proposed project) or by emissions from on-road vehicle trips (mobile sources) generated by a project.

Based on the current design, the proposed project may include a small heating, ventilation, and air conditioning (HVAC) system and hot water system. This system may be either electric or natural gas-fired. If natural gas-fired, it would generate on-site emissions. However, these systems would be very small and intended only to heat water for the limited bathroom facilities on the proposed project and serve a very small interior space. Based on the size of the potential gas-fired HVAC system, and the distance to sensitive uses of a similar or greater height than the HVAC stack, there would be no potential for direct adverse air quality impacts from stationary sources.

There would also be no adverse mobile source air quality impacts resulting from the proposed project. Peak event conditions at the proposed project would not generate incremental residents, workers, or visitors as compared with the No Action condition. Therefore, there would not be an increase in vehicle trips that would exceed the *CEQR Technical Manual* mobile source screening thresholds. Further, there are no existing sources of concern in close proximity to the proposed project (such as industrial or manufacturing businesses or large permitted sources). Therefore, there would be no significant adverse air quality impacts from the proposed project. No further analysis would be required.

GREENHOUSE GAS EMISSIONS

According to the *CEQR Technical Manual*, a greenhouse gas (GHG) emissions assessment is typically conducted only for larger projects undergoing an EIS, as well as in certain cases when the project would result in development of 350,000 square feet or greater, when the project is a city capital project, or when the project includes larger-scale power generation or has the potential to fundamentally change the City's solid waste management system. The proposed project does not meet any of the criteria that would warrant assessment of GHG emissions. No further analysis would be required.

NOISE

See Attachment G, “Noise.”

PUBLIC HEALTH

The proposed project would not result in any significant unmitigated adverse impacts to air quality, water quality, hazardous materials, noise, or any other CEQR analysis area. Therefore, no further analysis of public health is required, and no significant adverse impacts to public health are expected to occur as a result of the proposed project. No further analysis would be required.

NEIGHBORHOOD CHARACTER

As defined in the *CEQR Technical Manual*, neighborhood character is considered to be an amalgam of the various elements that define a neighborhood’s distinct personality. These elements may include a neighborhood’s land use, urban design, visual resources, historic resources, socioeconomics, traffic, and/or noise. An assessment of neighborhood character is generally needed when a proposed project has the potential to result in significant adverse impacts in any of the technical areas listed above, or when the proposed project may have moderate effects on several of the elements that define a neighborhood’s character. As discussed above and in the attachments to this EAF, the proposed project would not have significant adverse impacts in these technical areas or other areas related to neighborhood character, nor would it have the potential to result in a combination of moderate effects that could affect neighborhood character. While the proposed project would add a dramatic new park element to the neighborhood, it would not result in any significant adverse neighborhood character impacts and a detailed neighborhood character analysis is not warranted.

CONSTRUCTION

See Attachment H, “Construction.” ✷

A. INTRODUCTION

The proposed project would result in the redevelopment of Pier 54 as a public park pier with a different overwater footprint, containing approximately 117,000-gross square feet (gsf) of public open space. As part of the proposed project, the piles at the existing Pier 54 would be retained as a pile field. To develop the proposed project, various discretionary actions, including an amendment to the Hudson River Park General Project Plan (GPP) would be required. This attachment assesses the proposed project’s potential impacts on land use, zoning, and public policy within a ¼-mile study area, in accordance with the *City Environmental Quality Review (CEQR) Technical Manual*. The analysis characterizes existing conditions, evaluates changes in land use and zoning that are expected to occur independent of the proposed project, and identifies and addresses any potential impacts to land use, zoning, and public policy associated with the proposed project.

PRINCIPAL CONCLUSIONS

Overall, the proposed project would not have any significant adverse impacts on land use, zoning, or public policy. Compared to conditions in the future without the proposed project (the No Action condition), the proposed project would not result in any change in land use on the site, and it would be compatible with and complementary to nearby park, residential, and commercial uses. The proposed project would be consistent with zoning in the study area and would promote public policy goals with respect to completion and support of Hudson River Park, providing access to and revitalizing the waterfront, and protecting Hudson River habitat. The proposed pier would replace the existing, deteriorated Pier 54, which previously was used for active and passive public open space and park events (including events of a scale as envisioned with the proposed project), with a new pier that would allow for enhanced flexibility for parkland and cultural programming.

B. METHODOLOGY

The project site is located within Hudson River Park and adjacent to the Meatpacking District neighborhood in Manhattan. This analysis of land use, zoning, and public policy examines the area within ¼ mile of the project site, which is generally bounded by West 19th Street to the north, West 12th Street to the south, and Ninth Avenue and Hudson Street to the east (see **Figure B-1**).

The analysis begins by documenting existing conditions in the study area in terms of land use, zoning, and public policy. The analysis then projects land use, zoning, and public policy in the No Action condition by identifying developments and potential policy changes expected to occur within that time frame. The potential impacts of the proposed project are then assessed by comparing conditions with the proposed project with the projected conditions without the proposed project, which anticipates a replacement of Pier 54 with a rebuilt pier in its existing

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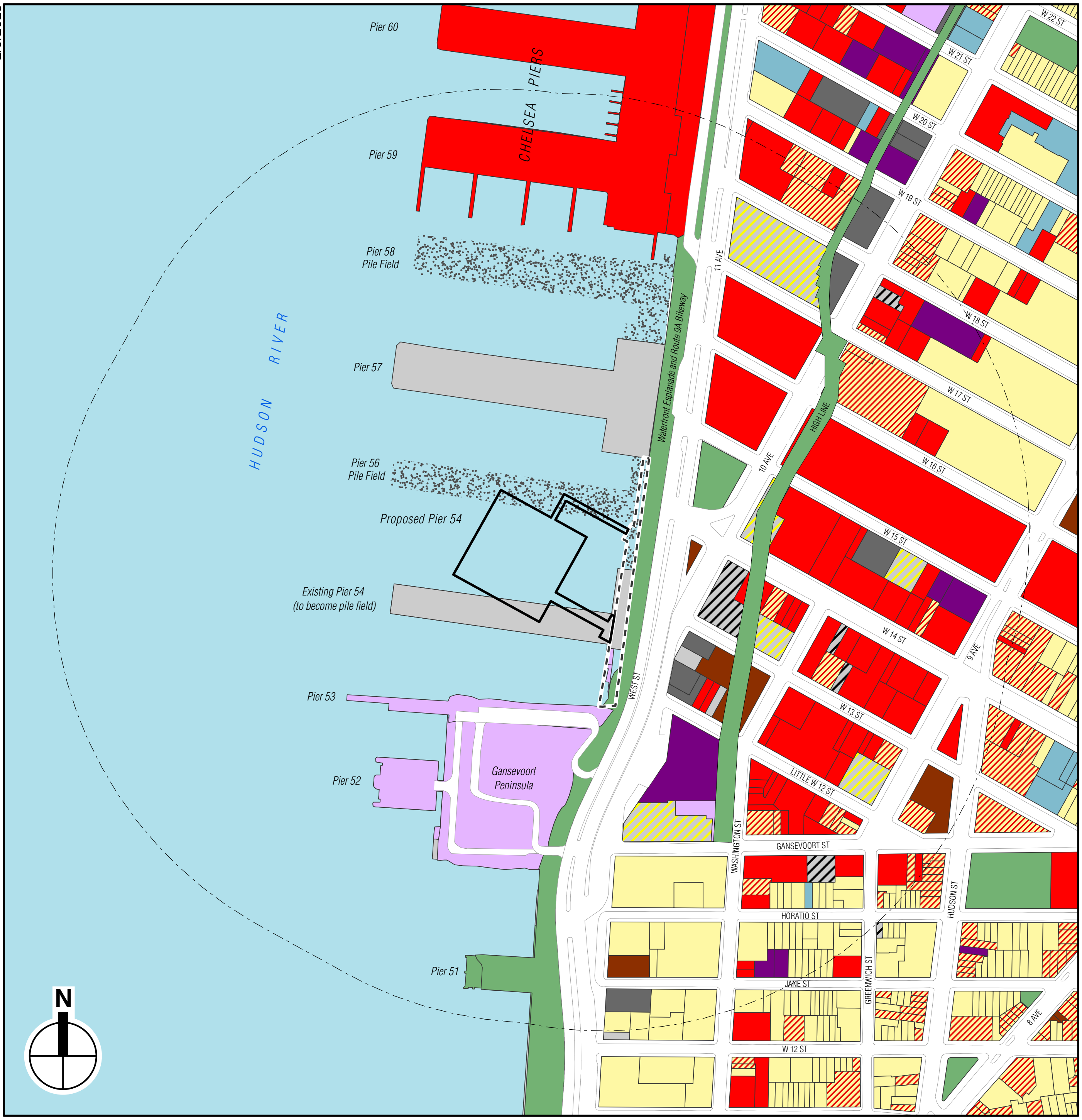

Project Site
1/4-Mile Study Area
Hudson River Park Future Pedestrian Platform Improvements (not part of proposed project)

Commercial and Office Buildings
Hotels
Industrial and Manufacturing
Open Space and Outdoor Recreation
Parking Facilities
Public Facilities and Institutions

Residential
Residential with Commercial Below
Transportation and Utility
Vacant Land
Vacant Building
Under Construction

0 400 FEET
SCALE

Existing Land Use
Figure B-1

location. While the performance areas would be less varied and flexible than the proposed project, the No Action pier would also host, as it has in the past, a variety of performance events of a similar size as the proposed project. It would have a capacity for peak events of up to approximately 5,000 attendees as with the proposed project. **Figure A-13** shows the deck plan for the rebuilt pier in the No Action condition.

C. EXISTING CONDITIONS

LAND USE

PROJECT SITE

The project site is generally located within the existing Pier 54 footprint and between the current Pier 54 footprint and the Pier 56 pile field, within Hudson River Park at approximately West 13th Street, in the Meatpacking District of Manhattan Community District 2 (see **Figure B-1**). The existing Pier 54 is located immediately south of the project site; to the east of the site are the Hudson River waterfront esplanade and the Route 9A bikeway and roadway. The existing pier is paved and marked by an iron arch along Route 9A. The pier was previously open to the public and used for various park events, but is now largely closed due to deteriorated pile and platform conditions. The general public can still access the portion of the pier that is still open, and a Learn to Bike program also makes use of the pier.

STUDY AREA

The ¼-mile study area is roughly bounded by West 19th Street to the north, West 12th Street to the south, and Ninth Avenue and Hudson Street to the east. The study area includes portions of Chelsea in Community District 4 as well as the Meatpacking District and West Village neighborhood in Community District 2.

The study area is characterized by a mix of residential and commercial uses in the south, and retail, restaurants, hotels, art galleries, and studios in the north. The study area has generally seen a trend toward the conversion or replacement of former industrial uses. The study area is also defined by major open space uses, most notably Hudson River Park to the north and south and the High Line Park to the east.

Route 9A is a major north-south thoroughfare that runs along the Hudson River waterfront east of the project site. Hudson River Park occupies the land between Route 9A and the waterfront, and is itself a major land use feature in the study area. The majority of the park, which extends continuously from just north of Chambers Street to West 59th Street, is linear, although it is expanded by multiple redeveloped piers along its length. The study area includes Piers 51, 52, 53, the Gansevoort Peninsula, Pier 57, and part of Pier 59, along with the upland area connecting them. As discussed below, the Gansevoort Peninsula, including Pier 52, currently contains City municipal sanitation operations; the New York City Department of Sanitation (DSNY) uses the majority of the site for truck parking and salt storage. Pier 53 is used by the New York Fire Department (FDNY) for Marine Company 1. Pier 59 is part of the 28-acre Chelsea Piers sports facility and event center, and Pier 57 is proposed for rehabilitation and redevelopment with new public open space, retail, restaurant, and other commercial, educational, and cultural uses. The study area also includes the Pier 56 and Pier 58 pile fields. East of Route 9A between West 14th and West 15th Street is the Hudson River Park area known as 14th Street Park, which serves the local population and visitors to the Meatpacking District with a grass oval and seating.

Also to the east of the Pier 54 site, across Route 9A, is a hotel, a surface parking lot, and a vacant lot that is being used for storage.

Residential uses are concentrated south of Gansevoort Street in the study area, in the West Village area south of the Meatpacking District. East of Washington Street this area is characterized by two- to five-story walk-up apartment buildings built before 1930, with commercial uses in converted industrial buildings along Washington Street. There are larger, 6- to 11-story residential buildings west of Washington Street.

West 14th Street separates the Meatpacking District to the south from the West Chelsea neighborhood to the north. Named for the concentration of slaughterhouses and packing plants that once dominated the area, the Meatpacking District has more recently experienced conversion of industrial space to high-end commercial and residential uses. The portions of the West Chelsea neighborhood that lie within the study area contain a mix of commercial buildings, large parking facilities, and a few industrial uses. Most of the building stock is characterized by old warehouses and industrial buildings that have been converted to commercial uses, mainly art galleries and studios. Chelsea Market occupies the block bounded by Ninth and Tenth Avenues on the east and west and West 16th and 15th Streets on the north and south, in the northeastern portion of the study area. The Chelsea Market building contains approximately 1 million square feet of commercial and retail space, including bakeries, delis, various eateries, and retail clothing. The building also houses television studios and office space.

High Line Park (the High Line) has its southern terminus in the study area, at the corner of Gansevoort and Washington Streets in the Meatpacking District. The High Line is an elevated former freight line that was converted into publicly accessible open space in 2009 and is now one of the prominent features of the study area. Section 1 of the High Line bisects the study area, running north from Gansevoort Street to the portion that crosses West 19th Street just west of and parallel to Tenth Avenue.

ZONING

PROJECT SITE

The project site is located in an M2-3 zoning district that covers most of the Hudson River piers from Harrison Street to West 59th Street (see **Figure B-2**). Land use and development within the project area is controlled by the Hudson River Park Act passed in 1998 as amended in 2013 ("the Act"), as well as by special zoning regulations designed to facilitate the park uses envisioned by the Act.

M2-3 manufacturing districts are found mainly in the City's older industrial areas along the waterfront, and allow for activities that fall between light and heavy industry. M2-3 districts allow heavier manufacturing and industrial uses than are permitted in M1 districts, and are subject to less stringent performance standards regarding smoke, noise, and vibration. Most retail uses are permitted in M2-3 zoning districts, but community facilities are not permitted. The maximum floor area ratio (FAR) is 2.0 for commercial or manufacturing uses and the maximum base height before setback is 60 feet.

A zoning text amendment was approved in October 1998 that allowed parks as a permitted use in the M2 and M3 zoning districts within the waterfront area in Manhattan Community Districts 1, 2 and 4. These areas include the M1-5, M2 and M3 zoning districts south of 59th Street that cover Hudson River Park.

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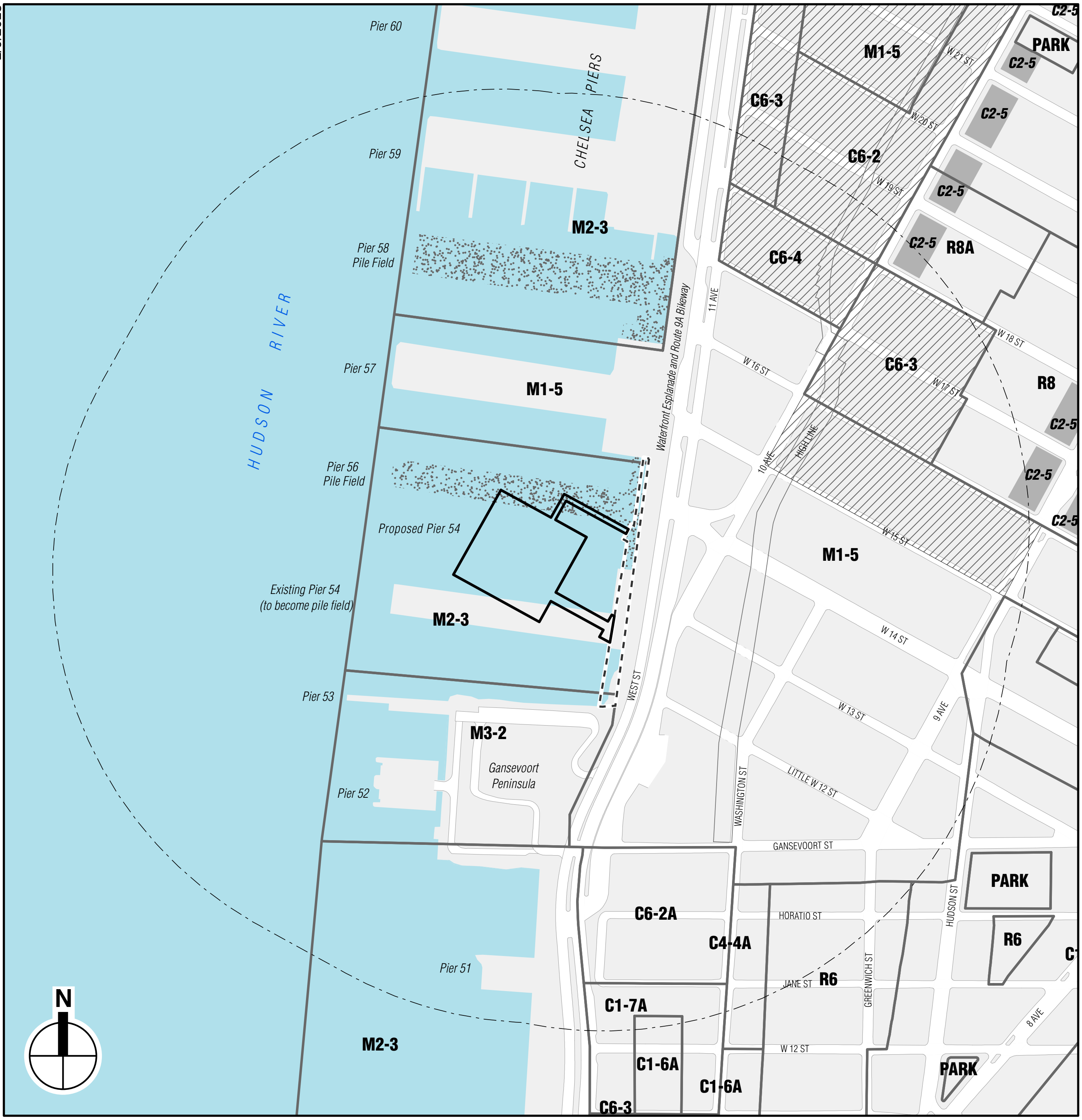

Project Site

1/4-Mile Study Area

Hudson River Park
Future Pedestrian Platform Improvements
(not part of proposed project)

Zoning Districts

Commercial Overlay Districts

Special West Chelsea District

0 400 FEET
SCALE

Hudson River Park Pier 54 Redevelopment

Existing Zoning
Figure B-2

STUDY AREA

The study area includes the M2-3 zoning district as well as other manufacturing, commercial, and residential districts. The zoning districts in the study area are summarized in **Table B-1**.

Table B-1
Study Area Zoning Districts

Zone	Allowable Floor Area Ratio (FAR)	Use
R6	0.78-3.0[1] Residential; 4.8 Community Facility	Medium-density general residential district
R8	0.94-6.02 Residential; 6.5 Community Facility	Higher-density general residential district
C1-6	2.0 Commercial; 0.87-3.44[2] Residential; 6.5 Community Facility	Commercial district predominantly residential in character and including local-serving retail
C1-6A	2.0 Commercial; 4.0 Residential[3]; 4.0 Community Facility	Commercial district predominantly residential in character and including local-serving retail
C1-7A	2.0 Commercial; 6.02 Residential[3]; 6.5 Community Facility	Commercial district predominantly residential in character and including local-serving retail
C2-5	1.0 Commercial within R1-R5; 2.0 Commercial within R6-R10	Commercial overlay mapped within residence districts
C4-4A	4.0 Commercial; 4.0 Residential[3]; 4.0 Community Facility	Contextual commercial district mapped in regional commercial centers
C6-2	6.0 Commercial[4]; 0.94-6.02 Residential[3,5]; 6.5 Community Facility[4]	High-bulk commercial district for uses requiring a central location; typically mapped in areas outside central business cores
C6-2A	6.0 Commercial; 6.02 Residential[3]; 6.5 Community Facility	High-bulk contextual commercial district with maximum building height
C6-3	6.0 Commercial[4]; 0.99-7.52 Residential[3]; 10.0 Community Facility[4]	General commercial district outside central business district
C6-4	10.0 Commercial[4]; 10.0 Residential[3,4]; 10.0 Community Facility	High-bulk commercial district
M1-5	5.0 Commercial; 5.0 Manufacturing; 6.5 Community Facility	Light manufacturing, high performance standards
M2-3	2.0 Commercial; 2.0 Manufacturing	Medium manufacturing; medium performance standards
M3-2	2.0 Commercial; 2.0 Manufacturing	Heavy manufacturing; low performance standards

Notes:
1. On wide streets outside the Manhattan Core.
2. 4.0 FAR on wide streets outside the Manhattan Core under Quality Housing Program.
3. Can be increased with Inclusionary Housing bonus.
4. Can be increased with 20% public plaza bonus.
5. 7.2 FAR on wide streets outside the Manhattan Core under Quality Housing Program.

Sources: New York City Zoning Resolution.

Special West Chelsea District

The northeastern portion of the study area is located within the Special West Chelsea District. The district encompasses approximately 13 whole blocks and two partial blocks between West 16th Street and West 30th Street, and Tenth and Eleventh Avenues. The City adopted the Special West Chelsea District Zoning Text Amendment in 2005. The general goals of this district include encouraging the mixed use character of West Chelsea through residential and arts-related development. The district also supports the restoration of the High Line as an accessible, public open space through special regulations and bonuses, while ensuring that new development enhances neighborhood character and the High Line open space. Finally, the district seeks to provide a transition to the lower-scale Chelsea Historic District to the east and the Hudson Yards area to the north.

The Special West Chelsea District specifies bulk and use controls that restrict development in order to reflect the area's early 20th century loft buildings and the character of the adjacent Chelsea Historic District. Along with the Zoning Text Amendment, the City rezoned portions of

West Chelsea from light manufacturing to mixed commercial and residential uses. The amendments allow residential and commercial development along Tenth and Eleventh Avenues and on some of the midblocks, while preserving some of the existing M1-5 zones.

PUBLIC POLICY

PROJECT SITE

Hudson River Park Plan

The project site is located within Hudson River Park, which stretches four miles along the Hudson River from just north of Chambers Street to West 59th Street, where it connects to Riverside Park South. Hudson River Park was the result of long-term efforts by the City and the State to transform the dilapidated, industrial Hudson River waterfront into a network of open space connected by a pedestrian walkway and the Route 9A bike path. The park also includes approximately 400 acres of lands under water. The Hudson River Park Plan reclaimed the waterfront for public use on a combination of piers and upland areas, and provides for revenue-generating uses within the park to finance the costs of maintaining the Park.

As part of Hudson River Park, the project site is governed by the Hudson River Park Act of 1998 (“the Act”), which identified the boundaries of Hudson River Park, established the water areas as an estuarine sanctuary, and created the Hudson River Park Trust as a public benefit corporation with the mandate to design, construct, and maintain the Park. The Hudson River Park Act regulates land use within the park, prohibiting or restricting residential, commercial office buildings, hotels, manufacturing, warehousing, casino gambling, and certain municipal uses throughout the 37 piers, upland property and water area included in the Park.

Pier 54 is a designated “park use” pier within the Act. Pursuant to the Act, among the uses permitted on “park use” piers are: (i) public park uses, including passive and active public open space uses; (ii) public recreation and entertainment, including the arts and performing arts, on open spaces; and (iii) facilities incidental to public access to, and use and enjoyment of park uses, such as concession stands, information stands, and comfort stations.

Waterfront Revitalization Program

The project site is located in the Coastal Zone designated by New York State and City, and is therefore subject to the Coastal Zone management policies of both the City and the State (see **Figure B-3**). The New York City Waterfront Revitalization Program (WRP) is the City’s primary coastal zone management tool. The WRP is made up of 10 major policies focusing on the goals of improving public access to the waterfront; reducing damage from flooding and other water-related disasters; protecting water quality, sensitive habitats like wetlands and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses.

Revisions to the New York City Waterfront Revitalization Plan (WRP) were approved by the City Council on October 30, 2013. The revisions are intended to reflect policy elements included in the New York City Department of City Planning’s (DCP’s) 2011 *Vision 2020 New York City Comprehensive Waterfront Plan*, including incorporation of climate change and sea level rise considerations to increase the resiliency of the waterfront area, promotion of waterfront industrial development and both commercial and recreational water-borne activities, increased

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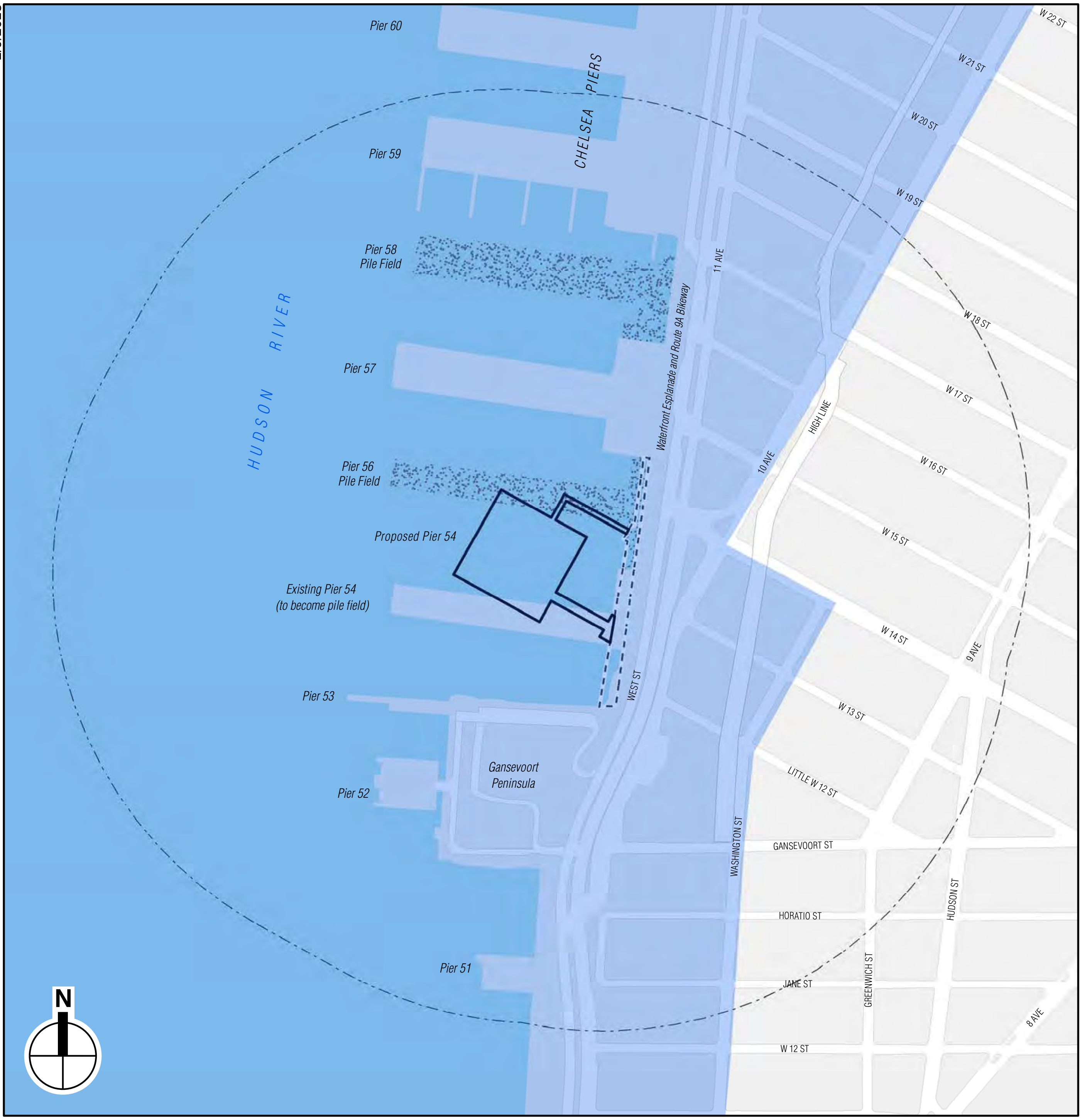


Project Site

1/4-Mile Study Area

Hudson River Park
Future Pedestrian Platform Improvements
(not part of proposed project)

Coastal Zone Boundary

0 400 FEET
SCALE

Hudson River Park Pier 54 Redevelopment

Coastal Zone Boundary
Figure B-3

restoration of ecologically significant areas, and design of best practices for waterfront open spaces.

The changes still must undergo review and approval by the New York State Department of State (NYSDOS) and the U.S. Department of Commerce. The proposed project's consistency with the WRP has been assessed using the 2013 revisions. An assessment of the proposed project's consistency with the New York City Waterfront Revitalization Program is provided below, in Section F.

STUDY AREA

Comprehensive Waterfront Plan

In March 2011, DCP released *Vision 2020: New York City Comprehensive Waterfront Plan*, a framework that aims to reinforce the connection between New Yorkers and the waterfront by increasing water transport, public access to the waterfront and economic development. The plan outlines eight goals for the 520 miles of New York City shoreline:

- Expand public access to the waterfront and waterways on public and private property for all New Yorkers and visitors.
- Enliven the waterfront with a range of uses integrated with adjacent uses in the upland communities.
- Support economic development on the working waterfront.
- Improve water quality through measures benefiting natural habitats, support public recreation, and enhance waterfront and upland communities.
- Restore degraded natural waterfront areas and protect wetlands and shorefront habitats.
- Enhance the public experience of the waterways that surround New York.
- Improve governmental regulation, coordination, and oversight of the waterfront and waterways.
- Identify and pursue strategies to increase the City's resilience to climate change and sea level rise.

Pier 54 is identified in the *Comprehensive Waterfront Plan* as part of the neighborhood reach strategies. Specifically, Pier 54 is identified in Reach 3-Lower West Side Manhattan, which seeks to "pursue funding and development of park" on Pier 54. The *Comprehensive Waterfront Plan* is also reinforced by the New York City Waterfront Action Agenda, a three year implementation component that includes high-priority projects designed specifically to catalyze investment on the waterfront.

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

LAND USE

PROJECT SITE

Absent the proposed project, in the "No Action condition," Pier 54 would be reconstructed in accordance with the authorizations received from the New York State Department of Environmental Conservation (NYSDEC) and U.S. Army Corps of Engineers (USACE) in 2005. Pier 54 would serve as public open space and would resume general park and event uses, consistent with its prior functions and the Hudson River Park Act. The rebuilt pier would incorporate some original elements from Pier 54, including the iron arch, in the reconstruction of the pier. The rebuilt pier would host events such as musical, theater, dance, films, and spoken word events. Consistent with its previous operation, the rebuilt No Action pier would have a capacity of approximately 5,000 attendees at peak events. The No Action condition would be consistent with past uses of the pier and surrounding uses in Hudson River Park.

STUDY AREA

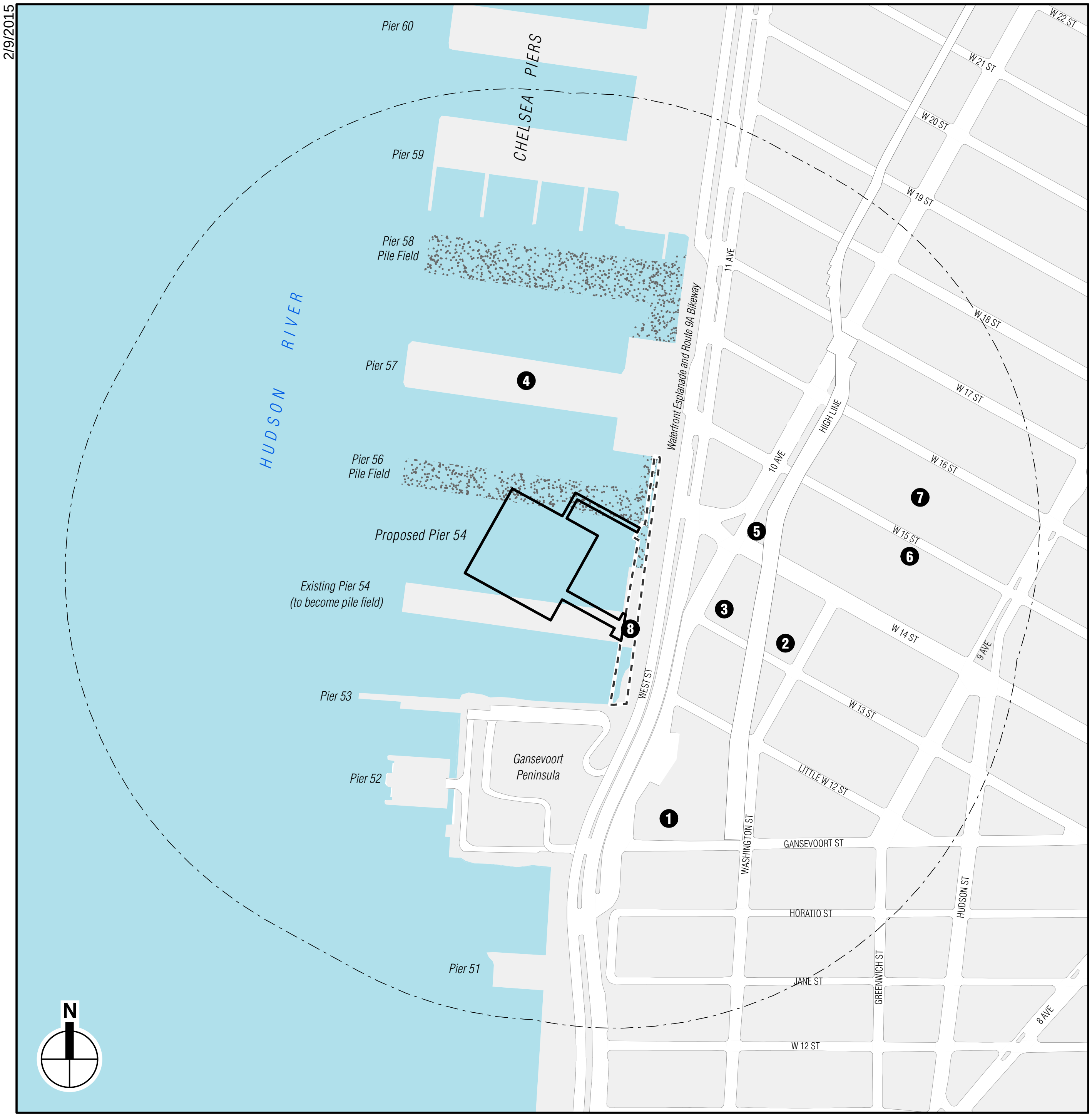
Current trends with respect to land use and development are expected to continue, resulting in further commercial and residential conversions of older industrial buildings in the area. As shown in **Table B-2** and **Figure B-4**, several developments under construction or planned in the study area are expected to be completed by the 2019 analysis year. Notable development projects near the project site are described below.

Table B-2
Development Projects Planned for Study Area by 2019

Map No.	Project Name	Address	Block; Lot	Program	Status/ Build Year
1	Whitney Gansevoort	Washington Street and Gansevoort Street	644; 5, 10	New Whitney Museum space; 241,017 sf	2015
2	860 Washington Street	860 Washington Street	646; 19	New 10-story, 120,413 sf mixed-use building; retail on first and second floors; office on floors 3–10	2015
3	40-56 Tenth Avenue	40-56 Tenth Avenue	646; 1	New office and retail building	Planned
4	Pier 57 in Hudson River Park	Pier 57 (Hudson River Park at approximately West 15th Street)	662; 3	Mixed-use facility containing office, retail, restaurant, and other commercial uses; a marina; and educational and cultural and public open spaces uses	2017
5	58 Tenth Avenue (Former Mobil Gas Station)	58 Tenth Avenue	712; 6	New 17,000 sf retail building	Under Construction
6	414 West 15th Street	412-414 West 15th Street	712; 42	New 24-story, 225-room hotel	Planned
7	Chelsea Market Expansion	401 West 15th Street	713; 1	Addition to existing building: 290,000 sf of office space	2016
8	Pier 54 Connector Project / Route 9A West 13th Street Crosswalk Project	Hudson River waterfront esplanade and Route 9A bikeway from Bloomfield Street to West 14th Street, West 13th Street and Route 9A	N/A	Improved and widened pedestrian platform, improvements to the Route 9A bikeway alignment, new lay-by area for future public bus stop, and landscaping; at-grade crosswalk across Route 9A at West 13th Street; preservation of the Pier 54 arch	2017

Note: sf = square feet
Sources: New York City Department of Buildings; DCP; New York City Board of Standards and Appeals; media coverage; *Pier 57 Redevelopment Final Environmental Impact Statement* (CEQR No. 11HRP001M); AKRF, Inc. field visits in March 2014.

In 2015, the Whitney Museum is expected to complete a new, 200,000-square-foot building on Gansevoort Street between West Street and the southern terminus of the High Line. The project will include 50,000 square feet of indoor galleries to house its collection, as well as 13,000 square feet of outdoor exhibition space on a series of rooftop surfaces. Directly north of the proposed project area, Pier 57 is approved for rehabilitation and redevelopment with new public open space, retail, restaurant, and other commercial, educational, and cultural uses.



Project Site

(1/4-Mile Study Area

Hudson River Park
Future Pedestrian Platform Improvements
(not part of proposed project)

1 Planned Project (see Table A-2 for description of projects)

0 400 FEET
SCALE

Planned Development
in the Study Area
Figure B-4

Independent of the proposed project, there would also be a widening of the esplanade between the Gansevoort Peninsula and Pier 57 as part of the Pier 54 Connector Project; funding is currently anticipated to be provided by a Congestion Mitigation and Air Quality improvement (CMAQ) program grant. The Pier 54 Connector Project would also result in improvements to the Route 9A bikeway alignment, new lay-by area for a future public bus stop, and landscaping. As part of the Pier 54 Connector Project, the Pier 54 arch will be retained in its existing location. Furthermore, the Gansevoort Peninsula will be redeveloped as open space as part of Hudson River Park once the City municipal sanitation facilities can be relocated. It is expected that the Gansevoort destructor plant building will be demolished by 2019, but the full redevelopment of the peninsula would not be completed until after the proposed project's build year; therefore, it is not included in **Table B-2**.

ZONING AND PUBLIC POLICY

Potential changes to zoning or public policy on the project site or elsewhere in the study area under the No Action condition are discussed below.

On November 13, 2013, amendments to the Act took effect which included, among other things, authorization for HRPT to transfer by sale any unused development rights within Hudson River Park to properties located up to one block east of the boundaries of the park, if and to the extent permitted by zoning, subject to conditions which require that any revenues derived from the transfer of development rights from Pier 40 must be used in the first instance for the repair of Pier 40 infrastructure. At present, there are no zoning provisions which authorize the transfer of unused development rights from Hudson River Park piers to properties outside the park boundaries. In the No Action condition, it can be expected that the City will consider whether to adopt such a transfer mechanism, and such a mechanism may be adopted and implemented. However, the nature of a transfer mechanism, the type and amount of transfer allowed, the location of potential receiving sites, the type and form of development permitted, as well as the likelihood and timing of adoption of such a mechanism, are not known at this time. It is further not expected that transfer of development rights would occur from Pier 54 because it is a designated public park pier as opposed to a pier where defined park commercial uses could occur.

DCP has proposed a zoning map amendment and zoning text amendment to expand the Special West Chelsea District to include a portion of a block bounded by West 15th Street and West 14th Street, and Ninth and Tenth Avenues within the West Chelsea neighborhood (ULURP applications 150101ZMM and N 150102ZRM). The rezoning area is located within the land use study area; however, no area of Hudson River Park is encompassed within the rezoning area. The proposal includes text amendments for modification of street wall regulations for some corner lots, a clarification of rear yard provisions, a correction of maximum building heights permitted in Subarea C of the Special West Chelsea District, and a provision to allow unenclosed sidewalk cafes on wide streets. The proposed expansion and modification of the Special West Chelsea District is intended to reinforce the context and scale of the district and implement height and setback controls on West 15th Street that are consistent with envelope regulations governing adjacent blocks. The proposal was the subject of an EAS published on August 29, 2-014 (15DCP037M) and was approved by the City Planning Commission (CPC) on December 17, 2014. The proposal was approved by the City Council on January 22, 2015, with modifications that would permit the enlargement of the existing building at 510 West 22nd Street per the underlying M1-5 zoning district regulations. The modified proposal was examined in an EAS and has been referred to CPC for consideration.

In the No Action condition, the public policies relating to the project site, including the goals of Hudson River Park Act, could still be met, as the rebuilt pier would involve the reuse of the pier for public open space uses, including access to the waterfront, open space and cultural events. Other waterfront and general development policies of the City including PlaNYC, the *Comprehensive Waterfront Plan*, and the waterfront action agenda would also be supported by the redevelopment of the project site in the No Action condition.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

LAND USE

The proposed project would result in the redevelopment of Pier 54 as a dramatic and innovative new public park pier with a different overwater footprint. The piles at the existing Pier 54 footprint would also be preserved as a pile field. The new pier would feature rolling topography and would be used as both a general recreation and cultural events space. The redeveloped pier would have two access ramps connecting to the Hudson River Park waterfront esplanade: a northern access ramp extending from near West 14th Street, and a southern access ramp extending from near Little West 12th Street, passing underneath the surface of the pier and connecting to the pathway in the southeastern portion of the pier. The proposed pier would host many events of a similar size, scale, and type as the rebuilt pier in the No Action condition, including events such as musical, dance, and film events. However, the configuration and design of the proposed pier would make it suitable for a wider range of performances than would be the case with the No Action condition. The proposed pier would have the same capacity as the rebuilt pier in the No Action condition, accommodating approximately 5,000 attendees for peak events.

As the Pier 54 site would be rebuilt as public open space in the No Action condition, the proposed pier would not result in any change in land use on the site. The uses introduced by the proposed project would be compatible with and complementary to nearby park, residential, and commercial uses, and would reestablish public access to the waterfront at this location. Compared with the No Action condition, the design of the proposed project would provide more design flexibility and opportunities for open space, landscaping, and cultural event programming, and would better support the natural habitat in the river (as discussed in more detail in Attachment F, “Natural Resources”).

Overall, the proposed project would have a positive effect on land use by creating a distinctive and visually dramatic new public pier in the park, and would allow the pier to resume its use as a public recreational and cultural events space serving the neighborhood and the larger city. Therefore, the proposed project would not result in any significant adverse impacts to land use on the project site or in the study area.

ZONING AND DISCRETIONARY ACTIONS

The proposed project would not affect the existing zoning of the project site or study area. Therefore, the proposed project would not result in any significant adverse impacts to zoning on the project site or in the study area.

The proposed project would require the following discretionary actions:

- HRPT approval of lease terms and amendment of the Park's existing General Project Plan.
- Modification to the previously issued NYSDEC permit under Article 15 of the Environmental Conservation Law (ECL) Protection of Waters, and Water Quality Certification under Section 401 of the Clean Water Act.
- Modifications to the previously issued USACE permits under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for construction of the proposed project within the Hudson River.

Under the proposed project, the pier would be partially visible in the West 13th Street visual corridor. Due to this partial obstruction, West 13th Street would no longer qualify as a visual corridor for zoning purposes. However, Little West 12th Street and West 14th Street would continue to function as visual corridors for zoning purposes and because the distance between them satisfies zoning standards for maximum distance between visual corridors, the requirements of the waterfront zoning would continue to be met. The change in status of West 13th Street would be reflected in a modification to the 1999 waterfront certification by the chairperson of the City Planning Commission for Hudson River Park.

PUBLIC POLICY

The proposed project would not include any changes to public policy on the project site or in the study area, and would be consistent with the public policies that currently govern the site and the surrounding area.

The proposed project would be consistent with the Hudson River Park Act in that it involves the reuse of the pier for public uses, including access to the waterfront, open space, and cultural space. The uses introduced by the proposed project would be consistent with and permitted under the Hudson River Park Act. Pursuant to the Act, among the uses permitted on "park use" piers are:

(i) Public park uses, including passive and active public open space uses;
(ii) Public recreation and entertainment, including the arts and performing arts, on open spaces; and
(iii) Facilities incidental to public access to, and use and enjoyment of park uses, such as concession stands, information stands, and comfort stations.

Furthermore, the Act specifically authorizes the reconstruction of Pier 54 outside its historic location. Therefore, the relocation of the pier just to the north of its current location and in a different configuration would be consistent with public policy.

As previously described, the proposed project is specifically identified in the *Comprehensive Waterfront Plan* as part of the neighborhood reach strategy for the Lower West Side of Manhattan. The strategy seeks to pursue the funding and development of park on the pier. The proposed project would directly support the Plan's goal of providing park uses on the pier. Therefore, the proposed project would be consistent with the *Comprehensive Waterfront Plan* and the strategy in Reach 3-Lower West Side Manhattan.

A consistency assessment of the New York City Waterfront Revitalization Program is provided below, in Section F.

Overall, the proposed project would not result in any significant adverse impacts to public policy.

F. NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM CONSISTENCY

Pier 54 is located within the City's designated Coastal Zone Boundary. Therefore, in accordance with the guidelines of the CEQR Technical Manual, an evaluation of the proposed project's consistency with the revised WRP policies was undertaken. As described above, the WRP policies are currently undergoing proposed revisions that have yet to be approved. An updated CAF has not yet been created to correspond to the proposed revisions. Therefore, the January 2003 version of the WRP CAF was used, but the policies analyzed for this section correspond to the proposed revisions to the WRP (see **Appendix B** for the WRP Coastal Assessment Form [CAF]).

The consistency assessment is provided below for all questions that were answered "yes" in the CAF, as well as any relevant revised or new policies. Therefore, the following consistency assessment includes policies 1, 2, 2.4, 3, 3.2, 4.1, 4.3, 5.1, 5.2, 6, 8, 8.4, 8.5, 9, and 10.1.

CONSISTENCY OF PROPOSED PROJECT WITH THE WATERFRONT REVITALIZATION PROGRAM POLICIES

New York City's WRP includes 10 principal policies designed to maximize the benefits derived from economic development, environmental preservation, and public use of the waterfront, while minimizing the conflicts among those objectives.

Policy 1: Support and facilitate commercial and residential development in areas well-suited to such development.

The proposed project would redevelop Pier 54 and reopen it as a public park pier for use as both a general recreation and cultural events space, which would be permitted park uses under the Hudson River Park Act. These uses would enhance Hudson River Park and would be compatible with the surrounding mixed-use neighborhood. Because the Hudson River Park Act prohibits residential use, the park is not an appropriate area for residential redevelopment, but the proposed project would provide open space resources that would support neighboring residential areas. Therefore, the proposed project would be consistent with this policy.

Policy 2: Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.

The proposed project would introduce recreational opportunities consistent with the Hudson River Park Act; water-dependent commerce (other than public water-borne transportation) and industrial uses are not permitted under the Hudson River Park Act on a pier designated for park-use only. Therefore, this policy does not apply.

Policy 2.4: Provide infrastructure improvements necessary to support working waterfront uses.

The project site does not currently house a working waterfront use, such as manufacturing or warehousing, nor would it under the proposed project, because such uses are prohibited by the Hudson River Park Act. Therefore, this policy does not apply.

Policy 3: Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.

The proposed project is located on the Hudson River, a commercial and recreational maritime center. The project would provide a water-dependent use in the form of a public access park pier. The project does not include the provision of or improvements to commercial or recreation boating, but it would not impede the use of the Hudson River as a waterway for commercial and recreational boating**.** Therefore, this policy does not apply.

Policy 3.3 Minimize conflicts between recreational, boating, and commercial ship operations.

The proposed project is located within a high use area, with a mix of recreational, commercial, and transportation vessels. There are multiple active mooring fields, boathouses, and marinas within Hudson River Park, and the redevelopment of Pier 54 would not result in added conflicts between recreational, commercial, and oceangoing freight vessels. The project would include fendering piles to protect the pier from waterborne vessels. Therefore, this policy does not apply.

Policy 4: Protect and restore the quality and function of ecological systems within the New York City coastal area.

Policy 4.1: Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas.

As analyzed in the Attachment F, "Natural Resources," the proposed project would not have any significant adverse impacts on the ecological quality and component habitats and resources within the Special Waterfront Areas, Recognized Ecological Complexes, and Significant Coastal Fish and Wildlife Habitats. It would also create a pile field. Therefore, the proposed project would be consistent with this policy.

Policy 4.6: In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.

As analyzed in the Attachment F, "Natural Resources," the proposed project would create approximately 1.94 acres of pile field habitat for some fish species. In addition, the proposed project would benefit insect pollinators such as butterflies and bees, and migratory and resident birds through the green landscaping of the pier with native plants tolerant of salinity from salt spray, winds, solar exposure and human use. Therefore, the proposed project would be consistent with this policy.

Policy 4.7: Protect vulnerable plant, fish, and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.

As analyzed in the Attachment F, "Natural Resources," the proposed project would not have any significant adverse impacts on vulnerable plant, fish, and wildlife species, and rare ecological communities. Therefore, the proposed project would be consistent with this policy.

Policy 5: Protect and improve water quality in the New York City coastal area.

Policy 5.1: Manage direct or indirect discharges to waterbodies.

The proposed project is not expected to result in discharge of additional nutrient pollutants in stormwater runoff. By creating a pier with planted areas, the redeveloped pier would result in a reduction in runoff rates to the Hudson River during rain events and an improvement in runoff water quality as compared with existing conditions and the No Action condition in which runoff from the Pier 54 platform would discharge directly to the Hudson River. With the proposed project, stormwater that falls on planted areas would be filtered through plant roots and through a sand-based soil medium prior to discharge to the river. Therefore, the proposed project would be consistent with this policy.

Policy 5.2: Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.

See response to Policy 5.1 above.

Policy 5.5. Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.

While the proposed project is not expected to implement grey-water strategies (e.g., capacity increases at wastewater treatment plants or the construction of new detention facilities and pumping stations), as described in the response to Policy 5.1 above, by creating a pier with planted areas, the redeveloped pier would result in a reduction in runoff rates to the Hudson River during rain events and an improvement in runoff water quality as compared with existing conditions and the No Action condition. With the proposed project, stormwater that falls on planted areas would be filtered through plant roots and through a sand-based soil medium prior to discharge to the river. Therefore, the proposed project would be consistent with this policy.

Policy 6: Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.

See response to Policy 6.2 below.

Policy 6.2: Integrate consideration of the latest New York City projections of climate change and sea level rise (as published by the NPCC, or any successor thereof) into the planning and design of projects in the city's Coastal Zone.

As discussed in Attachment F, "Natural Resources," the proposed pier structure is located within the 100-year flood plain (Zones VE and AE). The interpier area between the existing Pier 54 and the Pier 56 pile field has a Base Flood Elevation of +16 NAVD88 (current 100-year flood elevation—Zone VE: an area of high flood risk subject to inundation by the 1 percent annual-chance flood event with additional hazards due to storm-induced velocity wave action—a 3-foot or higher breaking wave). This is based on the currently applicable Preliminary Flood Insurance Rate Map (FIRM). The elevation of the proposed pier would range from a lower elevation of 7.65 NAVD88 in the support space under the amphitheater, 9.75 NAVD88 at the low point of the pier deck to a high point of the pier deck of 64.12 NAVD88. Therefore, the proposed project would be about 8 feet below the Preliminary FIRM 100-year flood elevation (current conditions) at the support space under the amphitheater, about 6 feet below the Preliminary FIRM 100-year flood elevation at the low point of the pier deck, and about 60 feet above the Preliminary FIRM 100-year flood elevation at the high point of the pier deck. Approximately 7 percent of the pier would be below the current 100-year flood elevation.

The New York City Panel on Climate Change (NPCC) projects that by the 2050s, sea levels would likely be between 11 and 21 inches higher than they are today (based on mid-range projections) and may increase by as much as 30 inches (90th percentile projections). By the 2080s, NPCC projects that sea levels would likely be between 18 and 39 inches higher than they are today (based on mid-range projections) and may increase by as much as 58 inches (90th percentile projections). The project's design would take into account potential sea level rise due to climate change and would include measures to address resiliency. The 100-year flood elevation in the 2080s would be approximately at 21 feet NAVD88. Overall, the vast majority of the proposed pier would be at elevation 16.65 feet NAVD88 or higher to minimize the risk of flooding. While only limited portions of the proposed project (primarily the interstitial space) would be located below the current 100-year flood elevation and the projected elevation with sea level rise, critical infrastructure would be either located above 21 feet NAVD88 or would be designed with flood resistant materials such that they could withstand flooding.

The project site contains a coastal floodplain, which is influenced by astronomic tide and meteorological forces (e.g., northeasters and hurricanes [FEMA 2013]) and not by fluvial flooding. Therefore, the proposed project would not have the potential to result in significant adverse impacts to the 100-year floodplain or result in additional flooding adjacent to the pier. For more details see Attachment F, "Natural Resources."

Therefore, the proposed project would be consistent with this policy.

Policy 8: Provide public access to and along New York City's coastal waters.

See responses to Policy 8.4 and 8.5 below

Policy 8.4: Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.

The proposed project is specifically intended to add and improve waterfront open space and recreation through the creation of new publicly accessible open space as determined by the Act. Pier 54, located within the 550-acre Hudson River Park, is an appropriate location for improvements to waterfront open space and recreation. The proposed project would add approximately 117,000 square feet of waterfront open space to the Hudson River Park. Therefore, the proposed project would help to develop waterfront open space and recreation on publicly owned land, and would be consistent with this policy.

Policy 8.5: Preserve the public interest in and use of lands and waters held in public trust by the state and city.

HRPT is a partnership between New York State and City charged with the design, construction and operation of the four-mile Hudson River Park. HRPT and Hudson River Park are governed by the Hudson River Park Act, a 1998 law that established both the park and its requirements. The proposed project would result in public open space improvements consistent with the intent of the Hudson River Park Act. Therefore, the proposed project would preserve the public interest of the lands and waters of the project site and would be consistent with this policy.

Policy 8.6: Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.

> The proposed project would apply many of the access principles listed in Policy 8.6. The proposed project would have two access ramps that would connect to the Hudson River Park's waterfront esplanade. Therefore, the proposed project would provide public access to the waterfront as well as to shoreline path systems. The proposed project would also apply many of the amenities principles listed in Policy 8.6. As described in Attachment A, "Project Description," it would be designed as a natural landscape with lawns, planted areas of shrubs and trees, and paved walking and seating areas. The topography would allow for greater variety in landscaping, and would provide multiple vantage points with views of the Hudson River, Hudson River Park and New York City. The proposed project would apply many of the environment principles listed in Policy 8.6, as landscaping for the proposed pier would be selected for tolerance to wind and salt exposure, and is being planned to provide four-season interest as well as a mix of sun and shade on the pier surface. In addition, the elevated pier would enhance opportunities for habitat. As the proposed pier would be elevated to contribute to flood resilience and enhance opportunities for habitat, the water access principles listed in Policy 8.6 would not apply. Infrastructure would be provided for a seasonal vessel that would facilitate and enhance cultural programming. Direct access to the water is provided at multiple other locations within Hudson River Park.

Policy 9: Protect scenic resources that contribute to the visual quality of the New York City coastal area.

The proposed project would not change any urban design features such that the context of natural or built visual resources is substantially altered. The proposed project would have a positive effect on visual resources, because it would provide new elevated vantage points for pedestrians to view the adjacent Pier 57, the Hudson River, the High Line, and the Manhattan skyline. The proposed project would partially obstruct the view along West 13th Street. While the new pier would be located within the West 13th Street visual corridor, that visual corridor does not provide unique views of the Hudson River vista in the study area. West 14th Street and Little West 12th Street also provide views of the Hudson River vista. With the proposed project, the Hudson River vista would remain visible within the West 13th Street corridor above the pier and views of the sky would be unobstructed, because the pier has been designed to have a low elevation within the visual corridor. The topography of the pier dips towards street level within the West 13th Street visual corridor, thereby allowing views over the pier to New Jersey. The new pier would not be located in the West 14th Street and Little West 12th Street visual corridors, which would continue to provide views of the Hudson River.

Overall, significant adverse impacts to visual resources would not occur as a result of the proposed project, and in some cases the project would be beneficial to visual resources. Therefore, the proposed project would be consistent with this policy.

Policy 10: Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City Coastal Area.

See response to Policy 10.1 below.

> *Policy 10.1: Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.*

The proposed project would be located in proximity to two historic resources—the Hudson River bulkhead and Pier 57.

The proposed pier would be adjacent to the Hudson River bulkhead, separated by a pedestrian walkway that will be built as part of the Pier 54 Connector project. As described in detail in Attachment D, "Historic and Cultural Resources," the Hudson River bulkhead between Battery Place and West 59th Street in Manhattan has been determined eligible for listing on the New York State and National Registers of Historic Places (S/NR), and is significant for its engineering and its connection to commerce and industry. The bulkhead was designed by George B. McClellan and constructed by the New York City Department of Docks between 1871 and 1936. The bulkhead was created to address the deteriorated, congested, and silt-filled condition of the waterfront, and its carefully built granite walls created a consistent and monumental surface to the waterfront that reinforced an image of the City's commercial prominence. Throughout its history, the Hudson River bulkhead has been built and reconstructed in segments in response to changing needs, and since the end of World War II, a variety of repairs has been made to the bulkhead walls, often without any attempt to create a uniform appearance. The portion of the bulkhead that is adjacent to the project site was constructed ca. 1899-1915 and is granite wall on wider concrete blocks with piles and buried, timber-relieving platforms.

Independent of the proposed project, the Pier 54 Connector Project will create a widened pedestrian walkway on a new overwater platform adjacent to the project site. The widened overwater pedestrian platform would extend beyond the existing bulkhead line within previously permitted limits. The new access ramps for the proposed project would connect with the widened overwater pedestrian platform, and thus would not directly touch the S/NR-eligible bulkhead. To avoid impacts on the Hudson River Bulkhead during construction of the proposed project, a construction protection plan would be implemented for the portions of the bulkhead that are located within 90 feet of project construction, close enough to be inadvertently damaged by construction activities. For these reasons, the proposed project is not anticipated to have any significant adverse impacts on the Hudson River Bulkhead.

The proposed project would be located in proximity to (approximately 200 feet south of) Pier 57, a S/NR-listed property. As described in detail in Attachment D, "Historic and Cultural Resources," Pier 57 was constructed as an ocean liner pier in 1950–1954 at the foot of West 15th Street, and is significant for its innovative engineering design. Designed by prominent civil engineer Emil Praeger, Pier 57 consists of a steel frame structure clad in metal with a brick façade headhouse. Pier 57 was widely publicized in engineering journals of the time for its unusual construction, and it continues to be seen by the profession as a significant innovation in the design of underwater foundations. The pier's structural system is unique within New York City and has never been repeated for a shipping pier in the city. Pier 57 remained in its original use until the late 1960s when Grace Lines relocated to New Jersey. It then became a bus depot for the Metropolitan Transit Authority. The 300,000 square foot pier has been vacant since 2004, but is currently planned for rehabilitation and redevelopment, as described below.

Although the proposed project would add a new visual element to the setting of Pier 57, it would not isolate this architectural resource from or significantly alter its setting or visual relationship with the streetscape; nor would it introduce incompatible visual, audible, or atmospheric elements to its setting; nor would it eliminate any publicly accessible view of Pier 57. Pier 57's historic context has already been altered by the demolition of Pier 56 and the shed on Pier 54 and by the recent construction of modern buildings within the westernmost portion of the S/NR Gansevoort Market Historic District, including the Standard Hotel and the new facility of the Whitney Museum of American Art. Further, the appearance of Pier 57 itself will be somewhat altered in the future without the proposed project through the creation of open space and a pavilion on the roof of the pier shed. While the proposed project would be located approximately 200 feet to the south of Pier 57 and would partially obstruct some views of the historic pier from the Hudson River Park bike and pedestrian path from south of the project site, these obstructed views would not result in a significant adverse impact. Historically, the former Pier 56 structure would have obstructed views of the Pier 57 pier shed and southern façade of the headhouse. The new pier's footprint would be separated from the westernmost edge of the future Pier 54 Connector project overwater pedestrian platform by approximately 135 feet, which would preserve northward views of Pier 57 along Hudson River Park and West Street. The topography of the new pier would also allow views to Pier 57. With the proposed project, views of Pier 57 would vary along Hudson River Park and West Street and would continue to be available from its immediate vicinity and from the east side of West Street and Tenth Avenue. In addition, Pier 54 itself would provide new, publicly accessible views of the historic Pier 57, from the surface of the new pier.

Though not an historic resource, it should be noted that independent of the proposed project, the Pier 54 arch will be retained in its existing location as part of the Pier 54 Connector Project described above.

For all of these reasons, the proposed project would be consistent with this policy. ✷

A. INTRODUCTION

According to the *City Environmental Quality Review (CEQR) Technical Manual*, a shadows assessment is required if a proposed project would result in new structures taller than 50 feet, or new structures of any height if the project site is located adjacent to a sunlight-sensitive resource. Sunlight-sensitive resources can include parks, playgrounds, gardens, and other publicly accessible open spaces; sunlight-dependent features of historic resources; and important natural features such as water bodies.

The proposed project would construct a new pier just north of the current location but with a different overwater footprint. It would also create a pile field at the existing Pier 54 footprint. The new pier would reach a maximum height of approximately 62 feet above Manhattan Borough Datum (MBD). Therefore, a shadows assessment was conducted to determine the extent and duration of new shadows on the river and any other nearby sun-sensitive resources and whether the new shadows could result in adverse impacts.

As noted in Attachment A, “Project Description,” the analysis assumed that absent the proposed project, the existing Pier 54 would be rebuilt in accordance with the authorizations received from the New York State Department of Environmental Conservation (NYSDEC) and U.S. Army Corps of Engineers (USACE) in 2005 (the No Action condition). The assessment therefore compares shadows from the proposed pier to shadows that would be cast by the rebuilt No Action pier.

PRINCIPAL CONCLUSIONS

The analysis concludes that the proposed pier would cast new shadows on portions of the surface of the Hudson River but that they would not result in any significant adverse impacts to aquatic ecology. Direct sunlight would reach under portions of the elevated proposed pier, particularly during early morning and late afternoon in all seasons when the sun is closer to the horizon and for much of the day in winter when the arc of the sun is lower in the sky. In contrast, the No Action pier would be constructed immediately above the water surface. The overall effect of the proposed pier’s higher elevation would offset its larger footprint and would result in a net improvement in light penetration to the water surface.

B. DEFINITIONS AND METHODOLOGY

This analysis has been prepared in accordance with CEQR procedures and follows the guidelines of the *CEQR Technical Manual*.

DEFINITIONS

Incremental shadow is the additional, or new, shadow that a structure resulting from a proposed project would cast on a sunlight-sensitive resource.

Sunlight-sensitive resources are those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. Such resources generally include:

- *Public open space* (e.g., parks, beaches, playgrounds, plazas, schoolyards, greenways, landscaped medians with seating). Planted areas within unused portions of roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources.
- *Features of architectural resources that depend on sunlight for their enjoyment by the public.* Only the sunlight-sensitive features need be considered, as opposed to the entire resource. Such sunlight-sensitive features might include: design elements that depend on the contrast between light and dark (e.g., recessed balconies, arcades, deep window reveals); elaborate, highly carved ornamentation; stained glass windows; historic landscapes and scenic landmarks; and features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as a historic landmark.
- *Natural resources* where the introduction of shadows could alter the resource's condition or microclimate. Such resources could include surface water bodies, wetlands, or designated resources such as coastal fish and wildlife habitats.

Non-sunlight-sensitive resources include, for the purposes of CEQR:

- *City streets and sidewalks* (except Greenstreets);
- *Private open space* (e.g., front and back yards, stoops, vacant lots, and any private, non-publicly accessible open space);
- *Project-generated open space.* Such open space cannot experience a significant adverse shadow impact from the project, according to the *CEQR Technical Manual*, because without the project the open space would not exist. However, a qualitative discussion of shadows on the project-generated open space should be included in the analysis where appropriate.

A significant adverse shadow impact occurs when the incremental shadow added by a proposed project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources. Each case must be considered on its own merits based on the extent and duration of new shadow and an analysis of the resource's sensitivity to reduced sunlight.

METHODOLOGY

Following the guidelines of the *CEQR Technical Manual*, a preliminary screening assessment is conducted to ascertain whether a project's shadow could reach any sunlight-sensitive resources at any time of year. The preliminary screening assessment consists of three tiers of analysis. The first tier projects a simple radius around the proposed structure representing the longest shadow that could be cast. If there are sunlight-sensitive resources within this radius, the analysis proceeds to the second tier, which reduces the area that could be affected by project shadow by accounting for the fact that shadows can never be cast between a certain range of angles south of the project site due to the path of the sun through the sky at the latitude of New York City.

If the second tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a third tier of screening analysis further refines the area that could be reached by project shadow by assessing specific representative days in each season and determining the maximum extent of shadow over the course of each representative day.

If the third tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a detailed shadow analysis is required to determine the extent and duration of the incremental shadow resulting from the project. The detailed analysis provides the data needed to assess the shadow impacts. The effects of the new shadows on the sunlight-sensitive resources are described, and their degree of significance is considered. The results of the analysis and assessment are documented with graphics, a table of incremental shadow durations, and narrative text.

C. PRELIMINARY SCREENING ASSESSMENT

A base map was developed using Geographic Information Systems (GIS)[1] showing the location of the proposed pier and the surrounding waterfront and street layout (see **Figure C-1**). In coordination with the land use, historic resources and natural resources assessments presented in other attachments of this Environmental Assessment Form (EAF), potential sunlight-sensitive resources were identified and shown on the map.

TIER 1 SCREENING ASSESSMENT

For the Tier 1 assessment, the longest shadow that the proposed pier could cast is calculated, and, using this length as the radius, a perimeter is drawn around the project site. Anything outside this perimeter representing the longest possible shadow could never be affected by project-generated shadow, while anything inside the perimeter needs additional assessment.

According to the *CEQR Technical Manual*, the longest shadow that a structure can cast at the latitude of New York City occurs on December 21, the winter solstice, at the start of the analysis day at 8:51 AM, and is equal to 4.3 times the height of the structure.

Therefore, with a portion of the pier at a maximum height of approximately 62 feet above MBD, the proposed pier could cast a shadow up to 267 feet in length (62 x 4.3). The two access ramps connecting the pier to the esplanade would reach a maximum height of about 15 feet above MBD and could therefore cast a shadow up to 65 feet on December 21 at 8:51 AM. Using these lengths, a perimeter was drawn around the project site representing the longest shadow study area (see **Figure C-1**). Two sun-sensitive resources were located within this perimeter: a portion of the Hudson River, and a portion of Hudson River Park and the Route 9A bikeway. Therefore, the next tier of assessment was conducted.

TIER 2 SCREENING ASSESSMENT

Because of the path that the sun travels across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given project site. In New York City this area lies between -108 and +108 degrees from true north. **Figure C-1** illustrates this triangular area south of the project site. The complementing area to the north within the longest shadow study area represents the remaining area that could potentially experience new, project-generated shadow.

A portion of the Hudson River and a portion of Hudson River Park and the Route 9A bikeway were located in the remaining longest shadow study area; therefore, the next tier of assessment was conducted.

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[1] Software: Esri ArcGIS 10.1; Data: New York City Department of Information Technology and Telecommunications (DoITT) and other City agencies, and AKRF site visits.

2/10/2015

Proposed Pier 54 and Access Ramps

Hudson River Park Overwater Improvements (not part of proposed project)

Publicly Accessible Open Space

Tier 1: Longest shadow study area boundary

Tier 2: Area south of site that could never be shaded by proposed structure

0 100 200 300 400 500 Feet

SCALE

Tier 1 and Tier 2 Assessments

Figure C-1

TIER 3 SCREENING ASSESSMENT

The direction and length of shadows vary throughout the course of the day and also differ depending on the season. In order to determine whether project-generated shadow could fall on a sunlight-sensitive resource, three-dimensional (3D) computer mapping software[1] is used in the Tier 3 assessment to calculate and display the proposed project's shadows on individual representative days of the year. A computer model was developed containing 3D representations of the elements in the base map used in the preceding assessments, the topographic information of the study area, and a 3D representation of the proposed project.

REPRESENTATIVE DAYS FOR ANALYSIS

Following the guidance of the *CEQR Technical Manual*, shadows on the summer solstice (June 21), winter solstice (December 21) and spring and fall equinoxes (March 21 and September 21, which are approximately the same in terms of shadow patterns) are modeled, to represent the range of shadows over the course of the year. An additional representative day during the growing season is also modeled, generally the day halfway between the summer solstice and the equinoxes, i.e., May 6 or August 6, which have approximately the same shadow patterns.

TIME FRAME FOR ANALYSIS

The shadow assessment considers shadows occurring between one and a half hours after sunrise and one and a half hours before sunset. At times earlier or later than this time frame for analysis, the sun is near the horizon, and the sun's rays reach the Earth at tangential angles, which diminishes the amount of solar energy and produces shadows that are long, move fast, and generally blend with shadows from existing structures until the sun reaches the horizon and sets. Consequently, shadows occurring outside the time frame for analysis are not considered significant under CEQR, and their assessment is not required.

TIER 3 SCREENING ASSESSMENT RESULTS

Figure C-2 illustrates the range of shadows that would occur, in the absence of existing buildings, from the proposed structure on the four representative days for analysis. As they move east and clockwise over the landscape, the shadows are shown occurring approximately every two hours from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset).

The assessment showed that new, project-generated shadows would fall on areas of the Hudson River adjacent to the proposed pier on all four analysis days. Project-generated shadows would not reach the Hudson River Park upland or any other sun-sensitive resources. A detailed analysis was therefore conducted to determine the extent and duration of new shadows on the river and to assess the shadows' effects, if any, on the ecology in the affected areas.

D. DETAILED ANALYSIS

The detailed analysis compares new incremental shadows that would fall on sunlight-sensitive resources as a result of the project, with shadows in the No Action condition.

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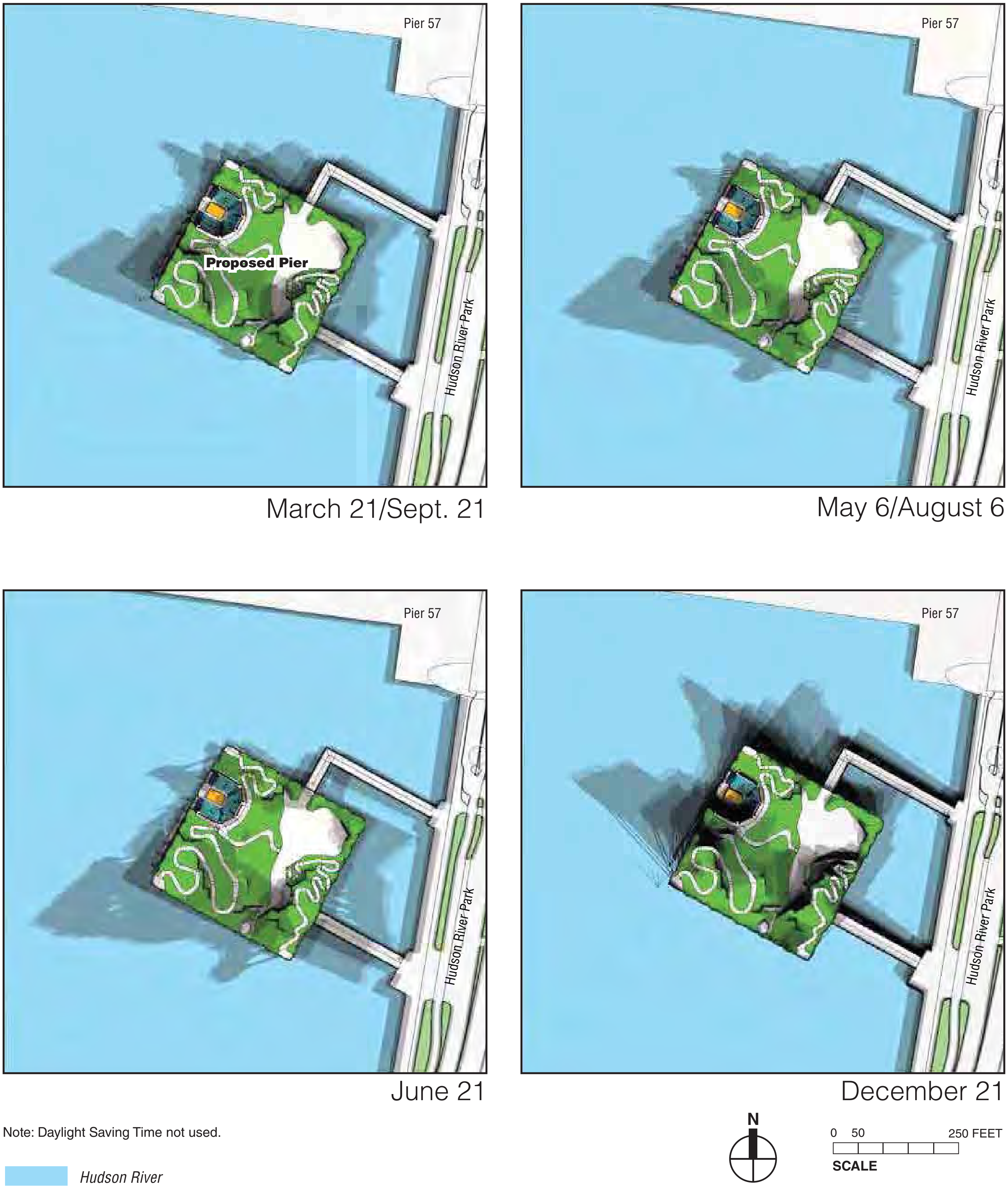
[1] MicroStation V8i (SELECTSeries 3).

2.8.15



Note: Daylight Saving Time not used.

Hudson River

Publicly Accessible Open Space

Shadow

This figure illustrates the range of shadows that would occur from the proposed structure, absent other existing buildings, on the four representative days. The shadows are shown occurring approximately every two to three hours from the start of the analysis day (one and a half hours after sunrise) to the end of the analysis day (one and a half hours before sunset). The Tier 3 assessment serves to illustrate the daily path or "sweep" of the proposed project's shadow across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow.

Tier 3 Assessment

Figure C-2

In the No Action condition, it is assumed that Pier 54 would be rebuilt at its current location in accordance with the authorization received from NYSDEC and USACE in 2005. Unlike the proposed project, the rebuilt No Action pier would be rectangular in shape, similar to other piers in Hudson River Park, and its topography would be flat. The rebuilt No Action pier would be approximately 84,300 square feet and would be supported on replacement piles. Three-dimensional representations of the previously approved pier and surrounding existing buildings in the study area were developed using data obtained from NYC DoITT, Sanborn maps, and photos taken during project site visits, and were added to the 3D model used in the Tier 3 assessment.

Shadows are in constant movement. The computer simulation software produces an animation showing the movement of shadows over the course of each analysis period. The analysis determines the time when incremental shadow would enter each resource, and the time it would exit.

Shadow analyses were performed for each of the representative days and analysis periods indicated in the Tier 3 assessment.

ANALYSIS RESULTS

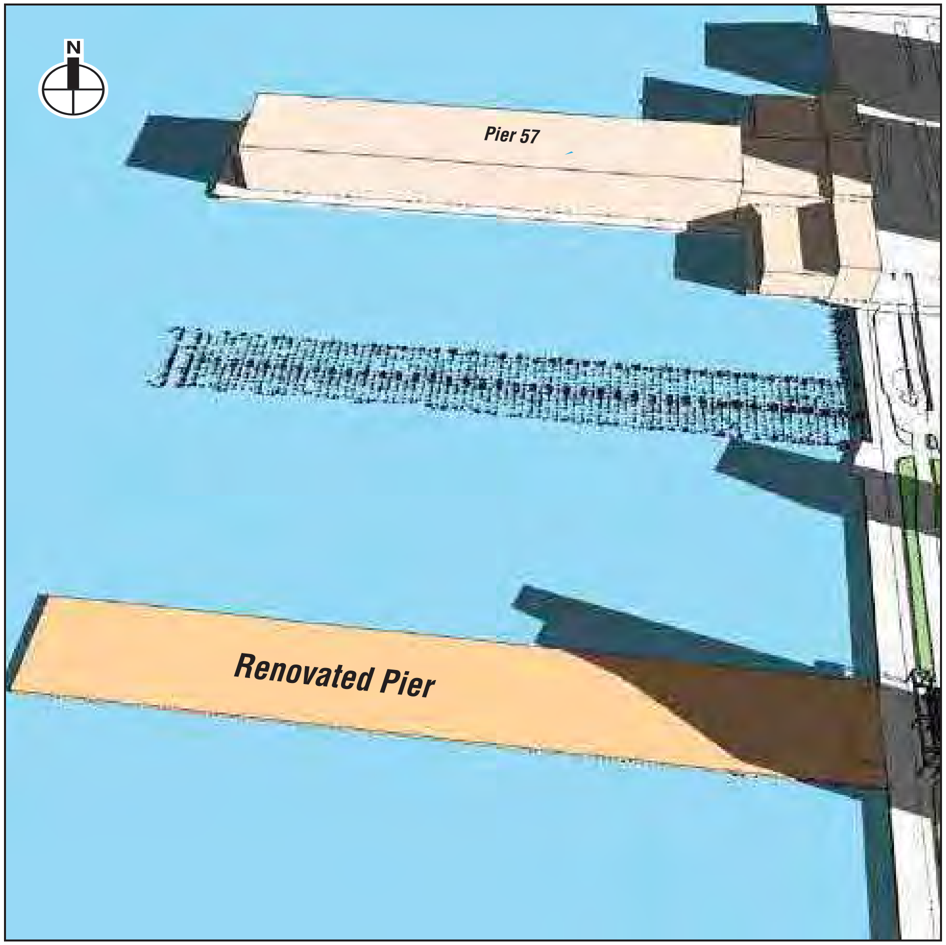
The proposed pier would cast areas of new shadow on the river beneath it and adjacent to it throughout the analysis period on each of the four representative days. Specifically, on March 21/September 21, new incremental shadow would fall on portions of the river from 7:36 AM to 4:29 PM EST. On May 6/August 6 incremental shadow would fall from 6:27 AM to 5:18 PM EST. On June 21, incremental shadow would fall from 5:57 AM to 6:01 PM EST. On December 21 incremental shadow would fall from 8:51 AM to 2:53 PM EST.

In the No Action condition, shadow would be cast under the reconstructed pier, whereas with the proposed project, those shadows would not exist. Similar to the incremental shadows with the proposed project, shadows in the No Action condition would fall on the river from the start to the end of all four representative days. However, in the No Action condition the pier would be located close to the water's surface and would cast shadow directly onto the water beneath it, shading virtually the same area throughout the day, whereas shadow from the proposed project's elevated pier and walkways would move, shading different areas at different times of day and allowing direct sunlight to reach portions of the water surface beneath it.

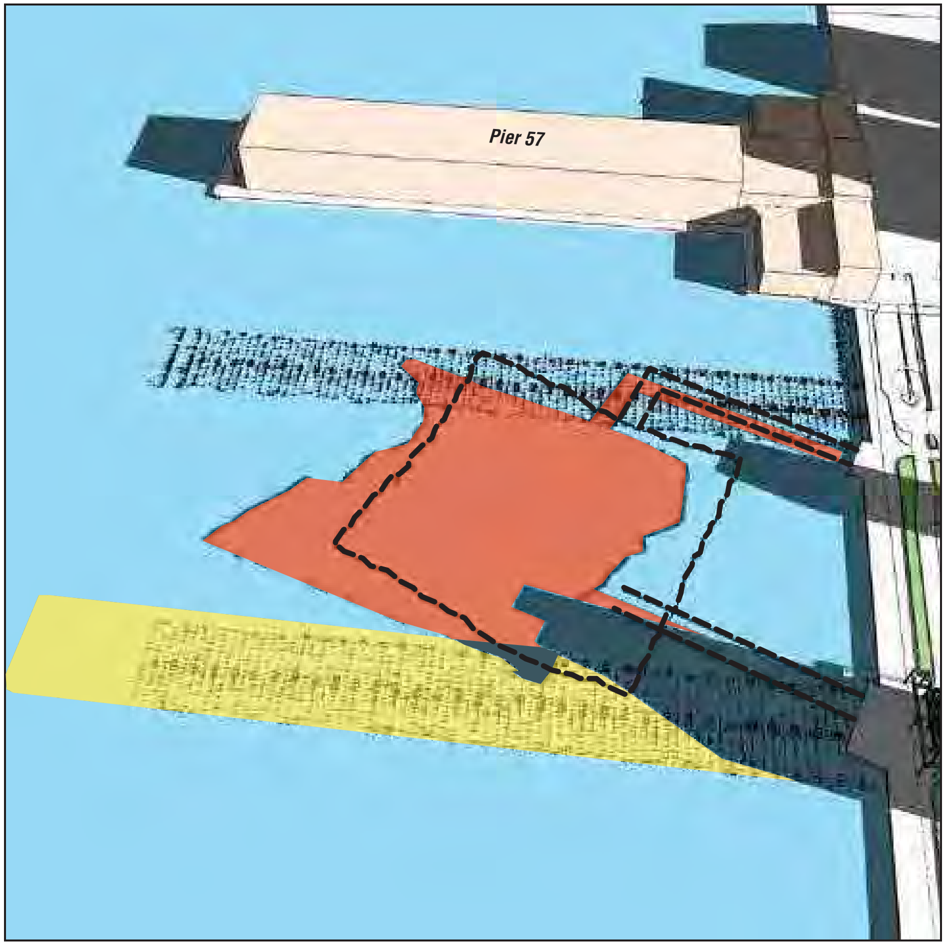
Figures C-3 through C-22 document the results of the analysis by providing graphic representations from the computer animation of representative times on each of the four analysis days. The figures illustrate the extent of additional, incremental shadow at that moment in time (highlighted in red) and also show areas of reduced shadow compared with the previously approved pier (highlighted in yellow), and other existing shadows and remaining areas of sunlight.

CONCLUSIONS

Construction of the proposed pier and the two access ramps would result in a total of approximately 117,000 square feet of overwater structure, a net increase of 32,700 square feet compared with the previously approved No Action pier. However, large portions of the proposed pier would be situated higher above the water surface on piles—for example, on the southern side elevations would range from approximately 62 feet on the southwest corner to 15 feet in the middle of the south edge and about 44 feet at the southeast corner. In contrast, the No Action



No Action Condition



With Action Condition

Proposed Pier

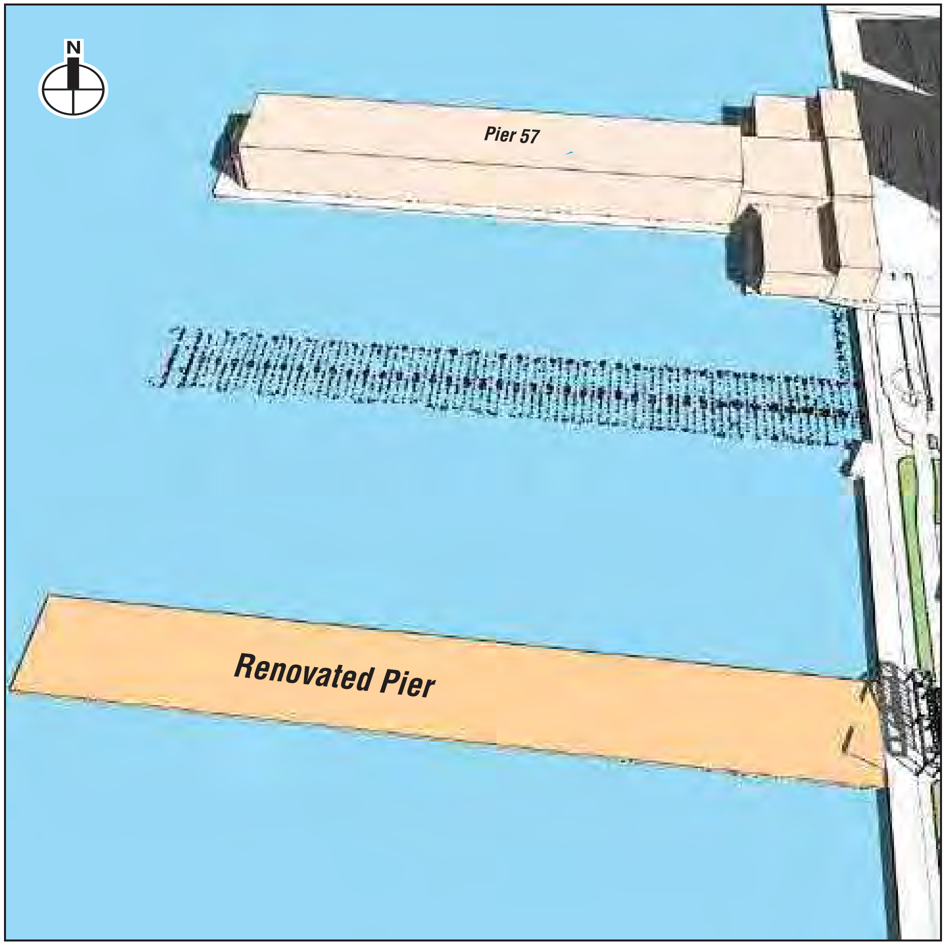
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

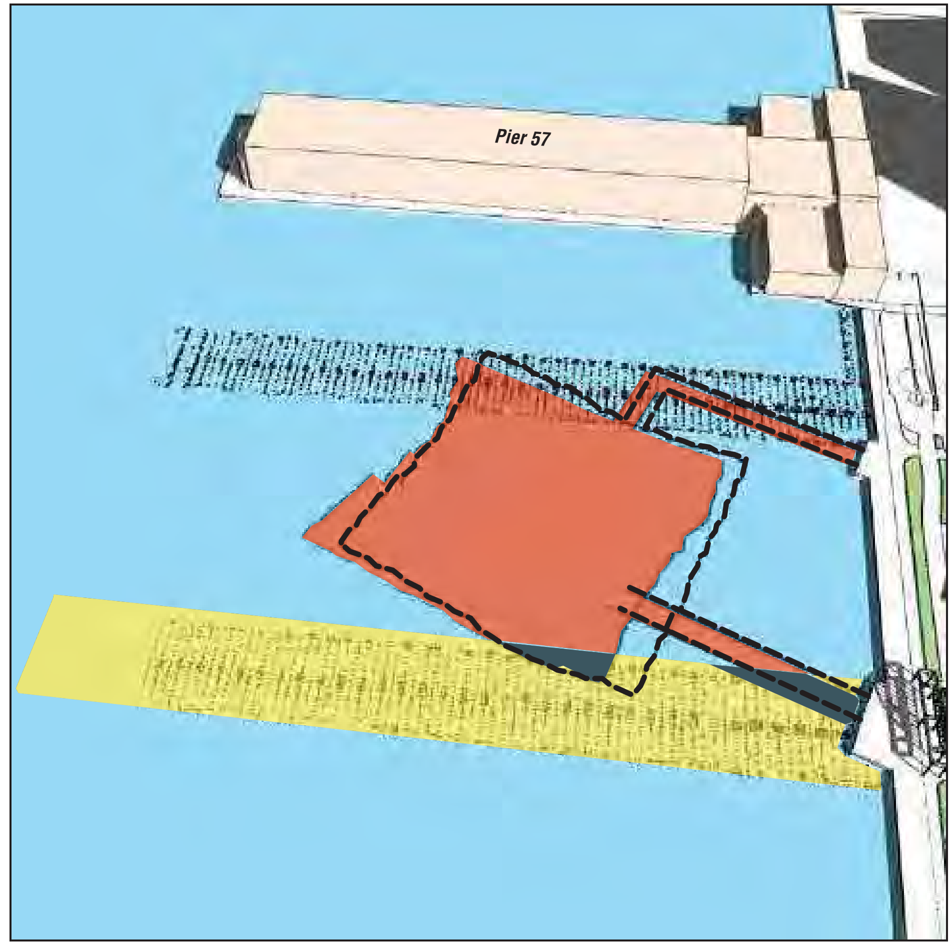
Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

March 21 / Sept. 21—8:00 AM
Figure C-3

2.8.15



No Action Condition



With Action Condition

Proposed Pier

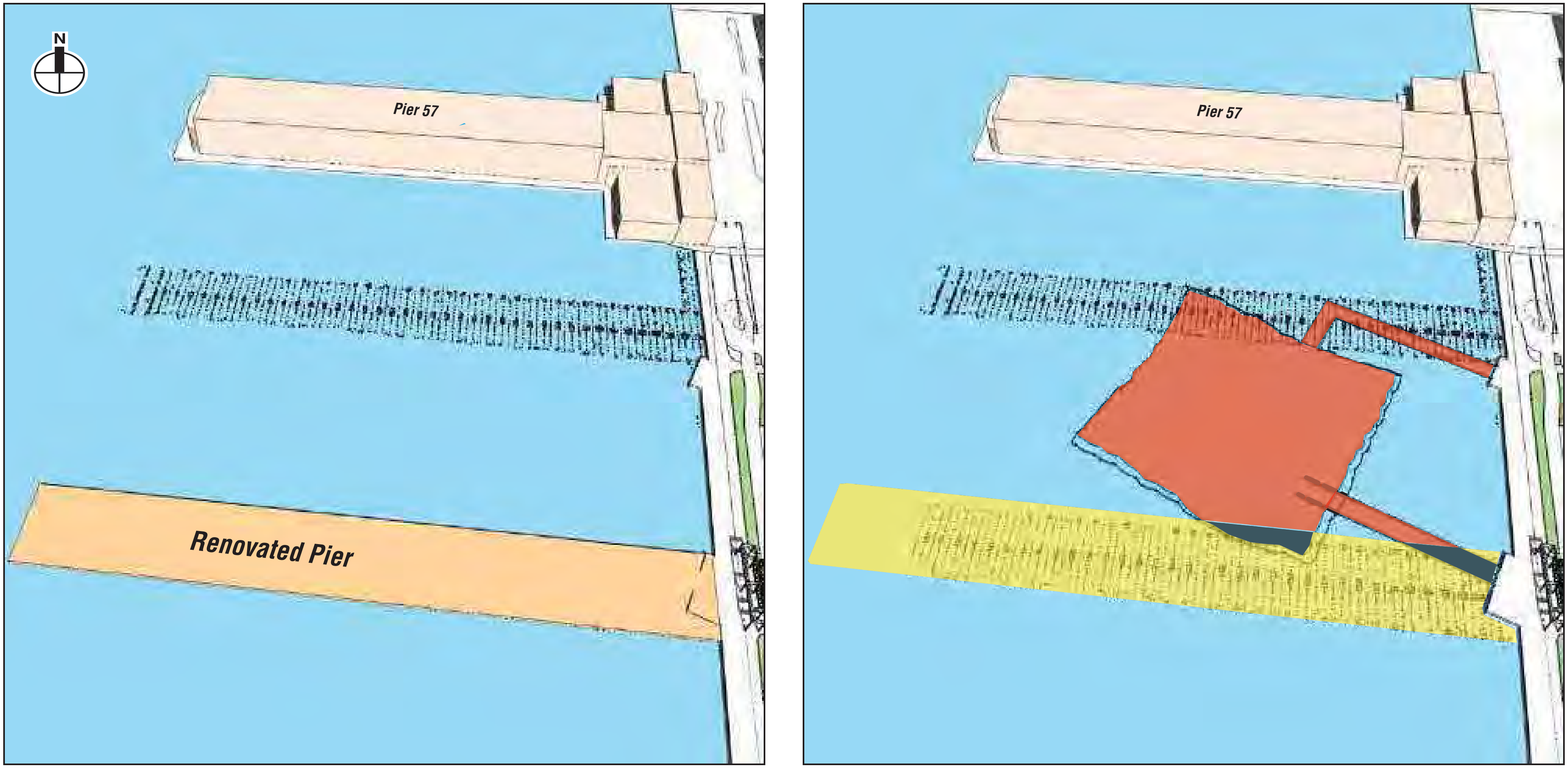
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

March 21 / Sept. 21—10:00 AM
Figure C-4

2.8.15



No Action Condition

With Action Condition

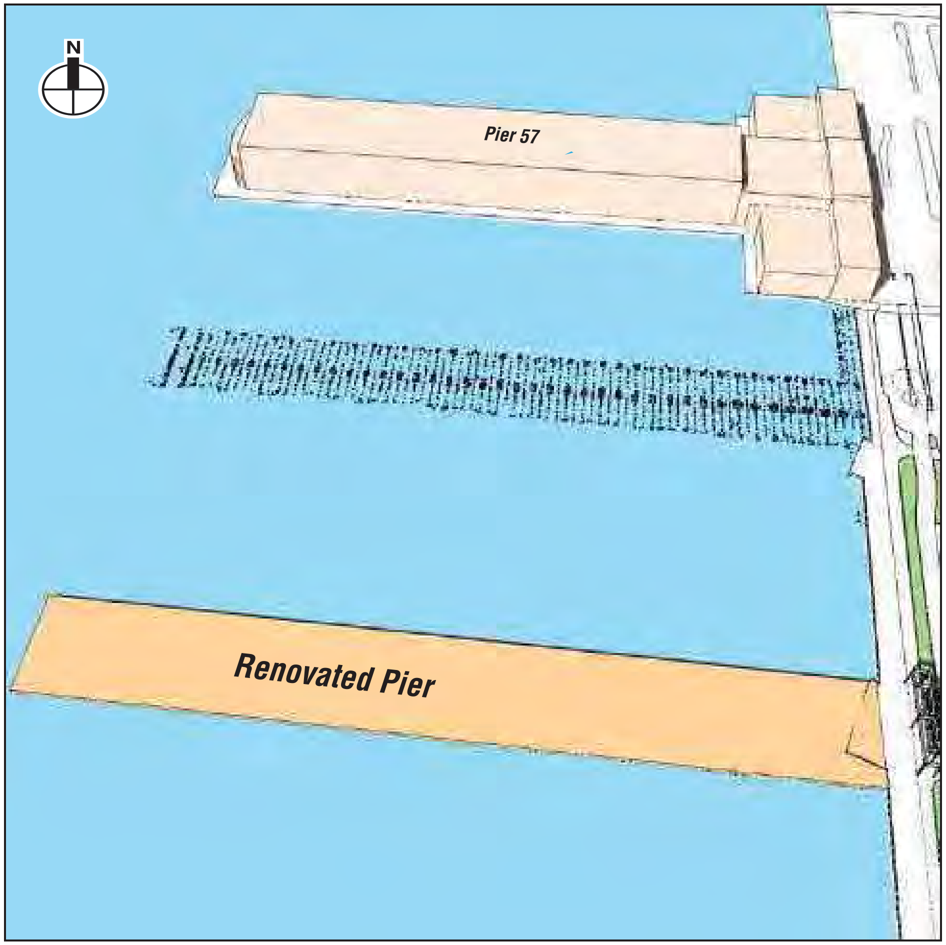
Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

2.9.15



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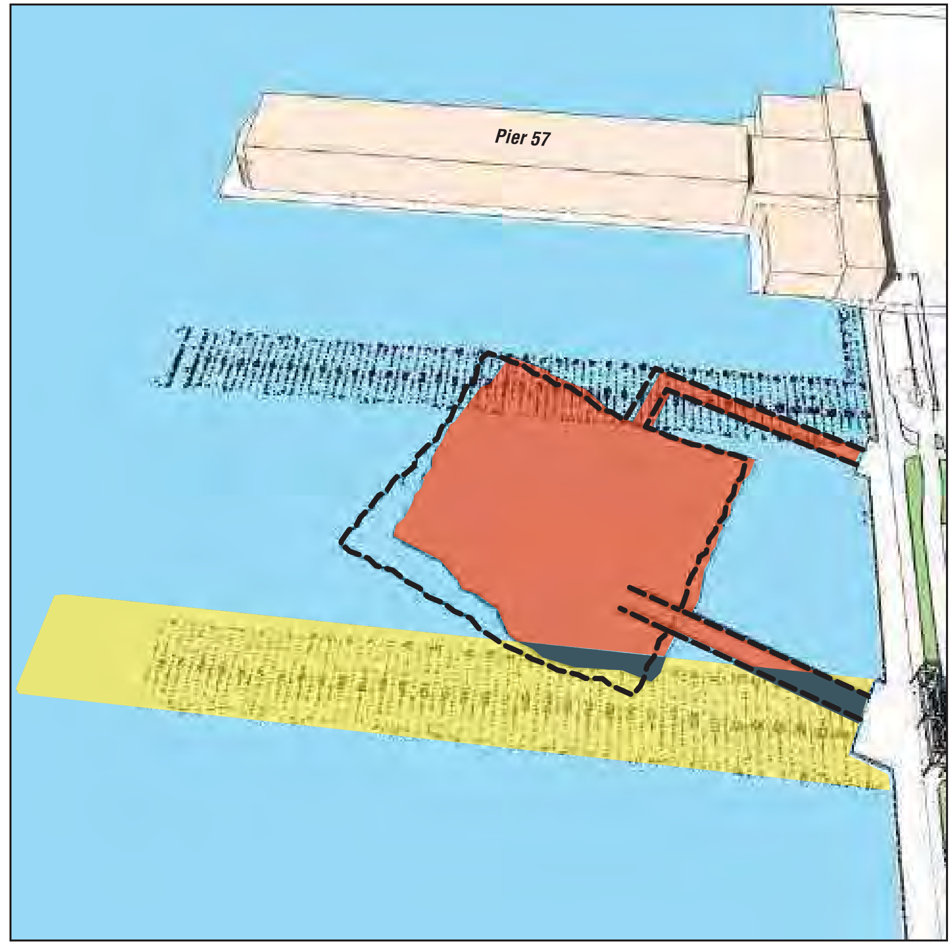


With Action Condition

Proposed Pier

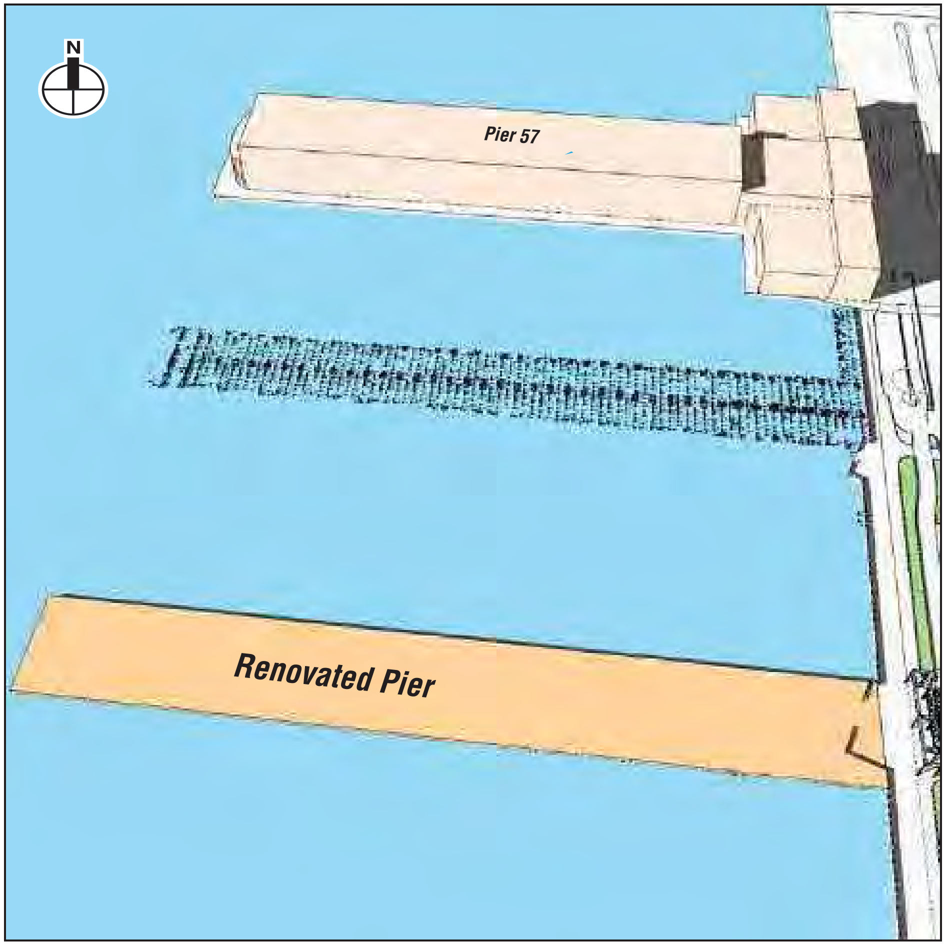
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

March 21 / Sept. 21—2:00 PM

Figure C-6



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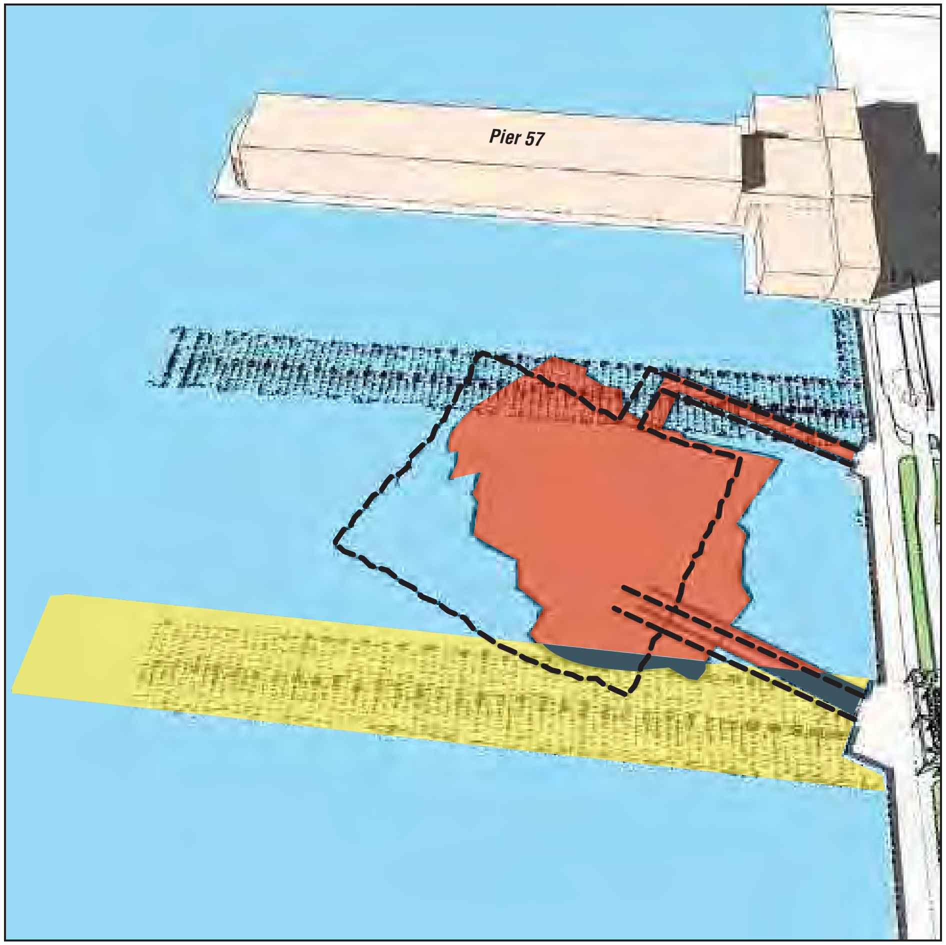


With Action Condition

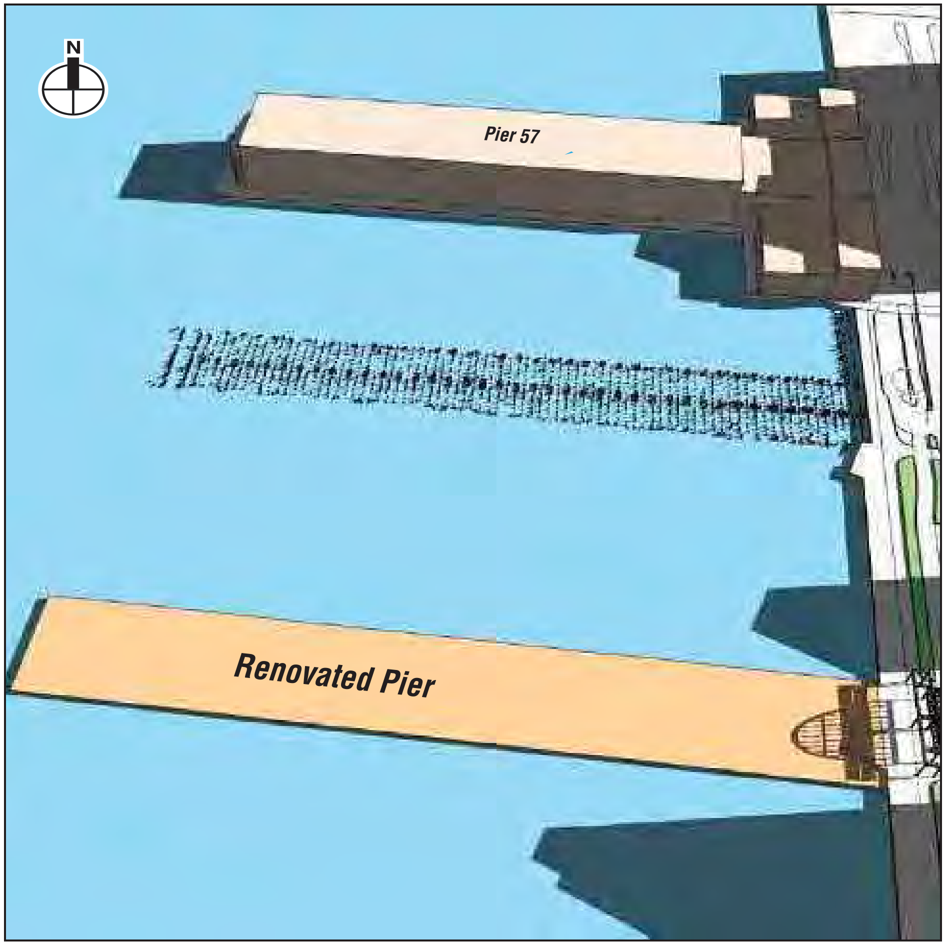
Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

March 21 / Sept. 21—4:00 PM
Figure C-7



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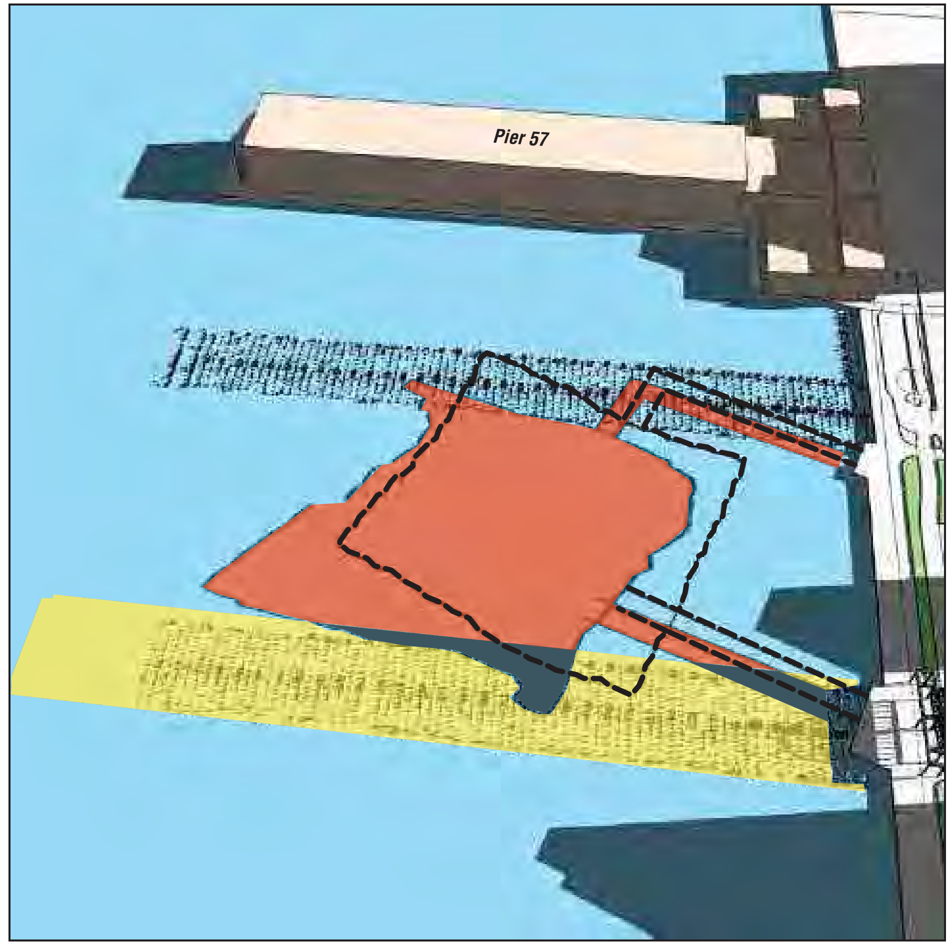


With Action Condition

Proposed Pier

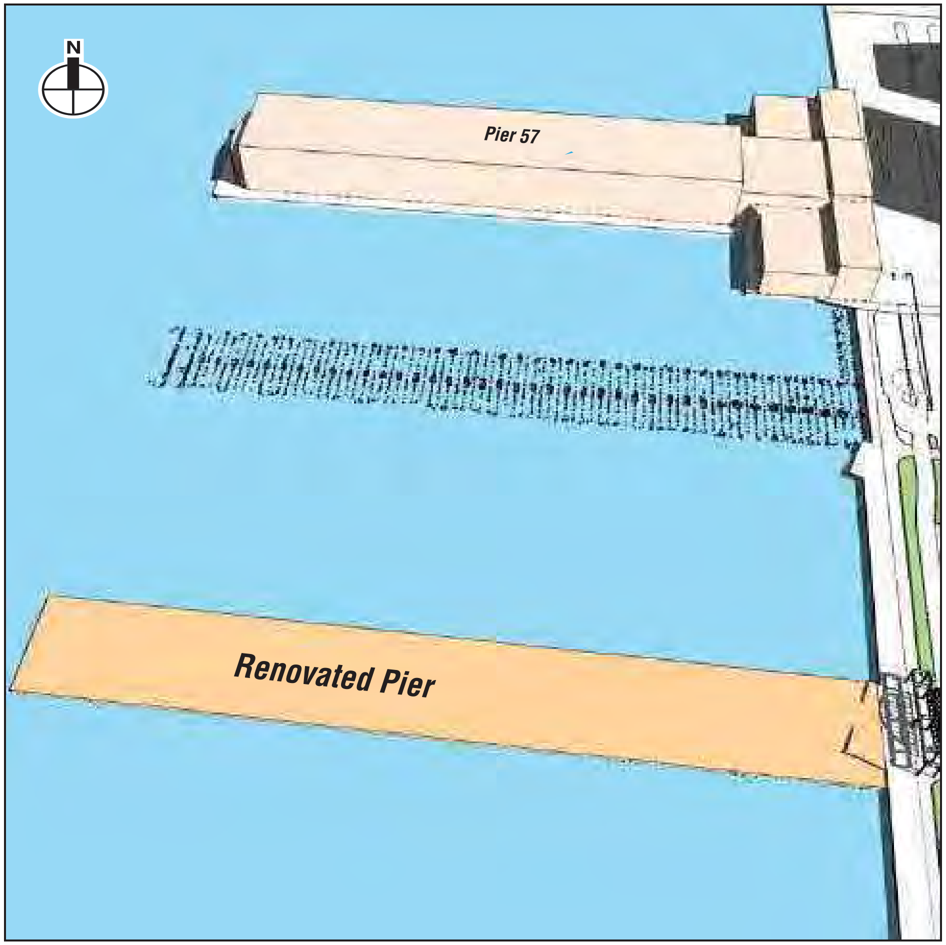
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

May 6 / August 6—7:00 AM
Figure C-8

2.9.15



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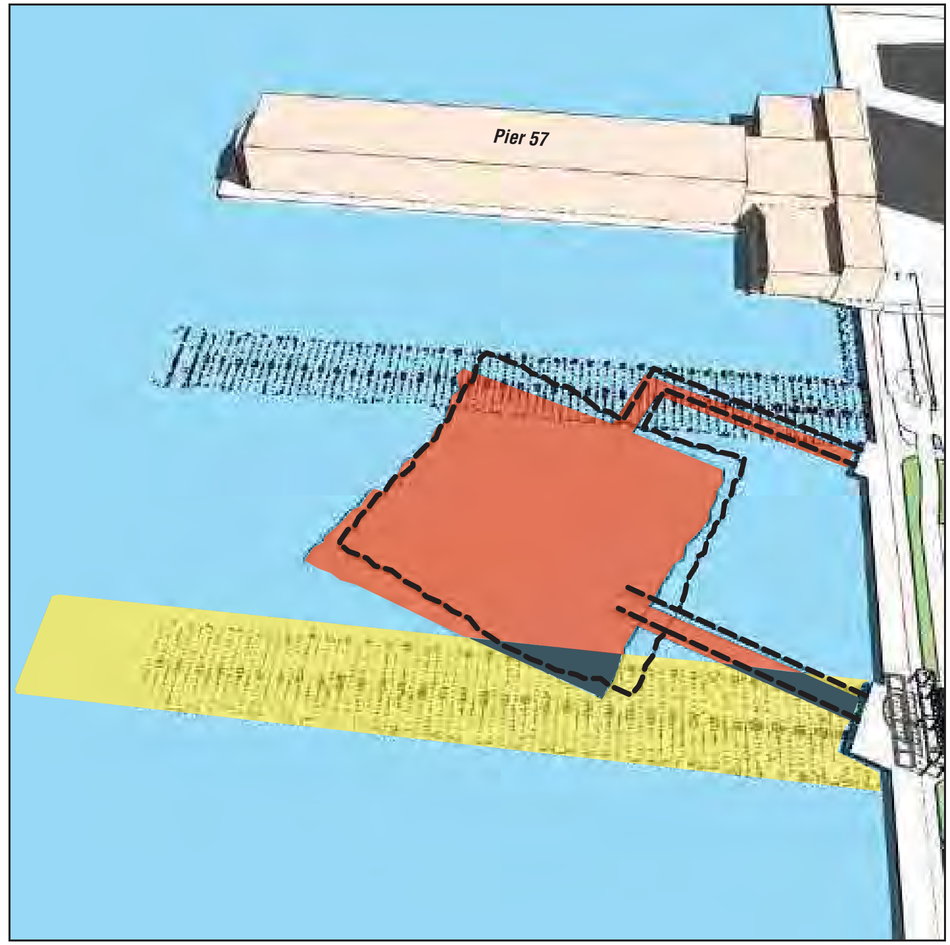


With Action Condition

Proposed Pier

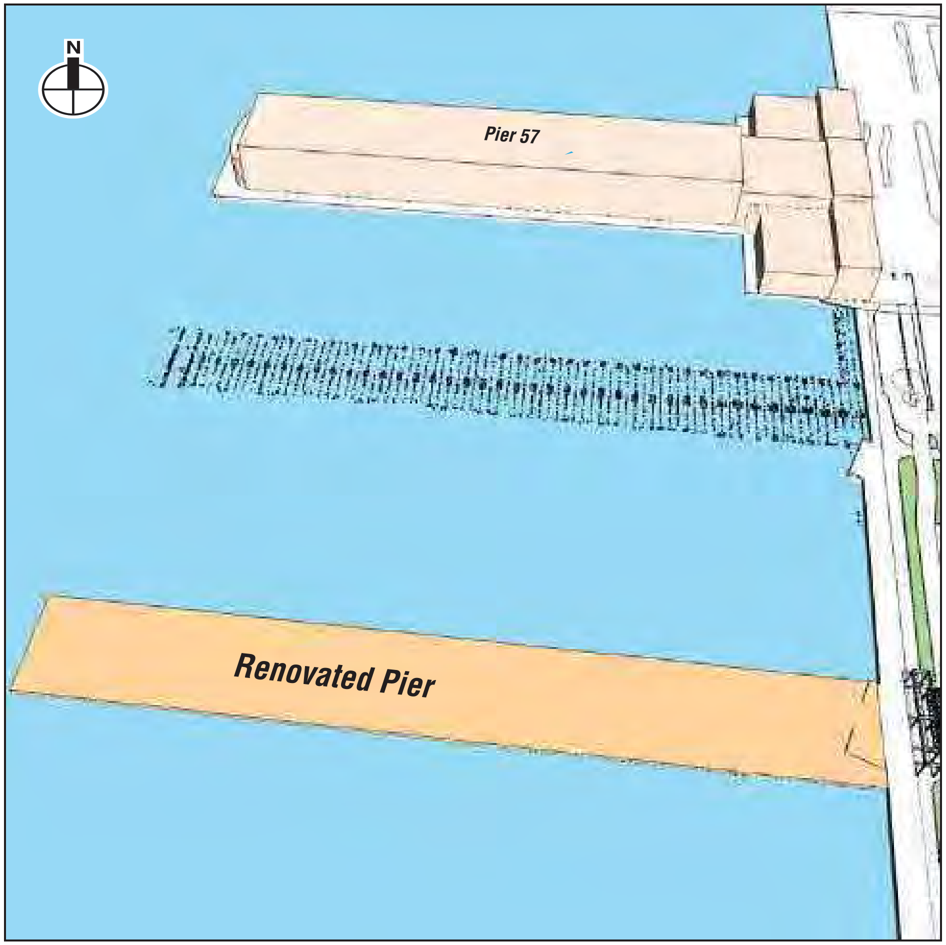
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

May 6 / August 6—9:30 AM

Figure C-9



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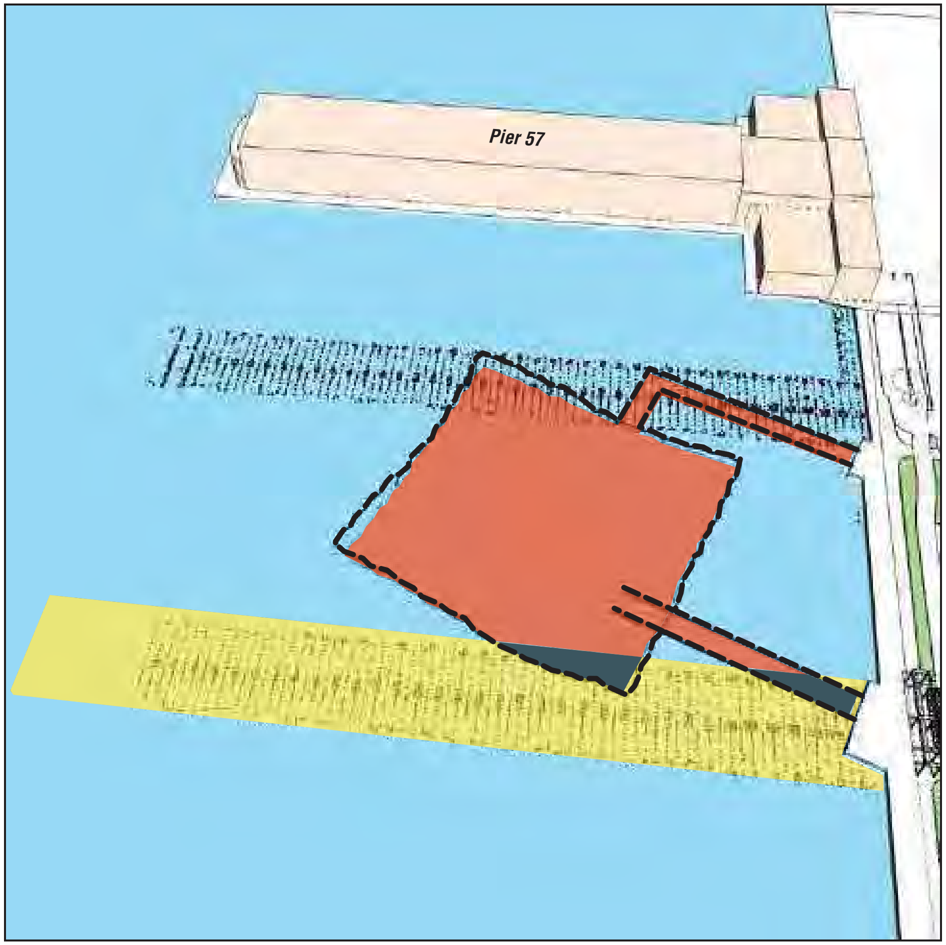


With Action Condition

Proposed Pier

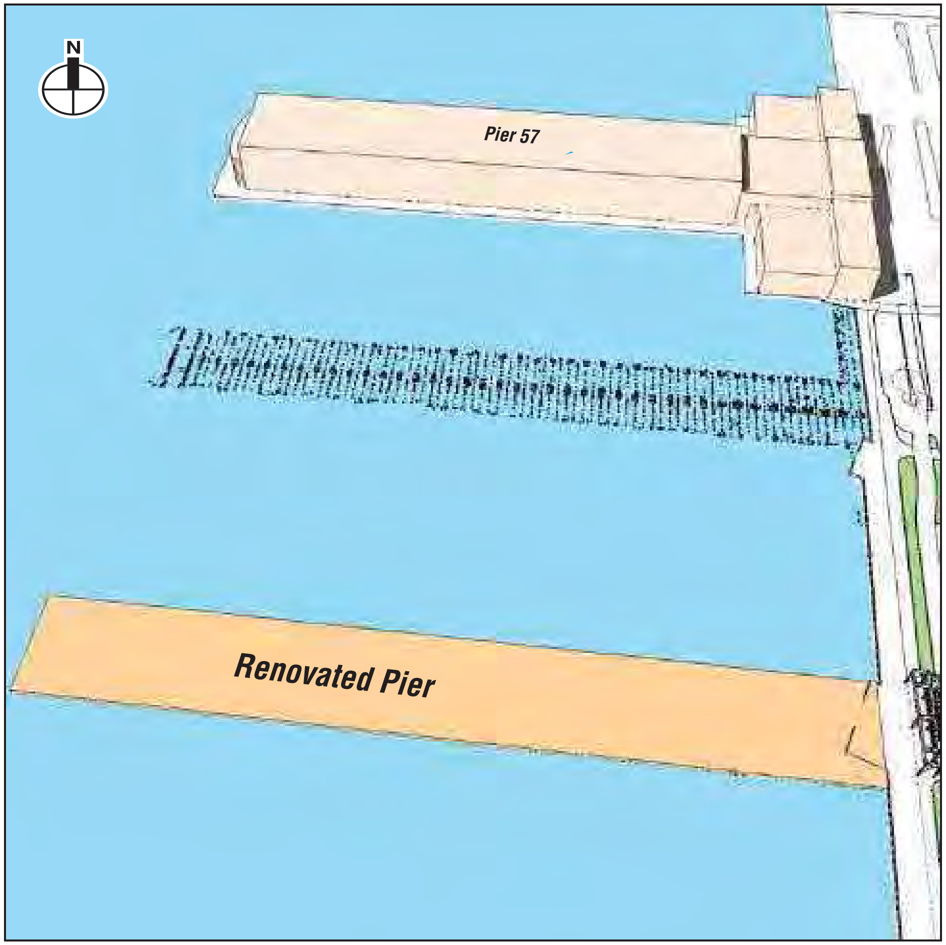
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

May 6 / August 6—12:00 PM
Figure C-10

2.8.15



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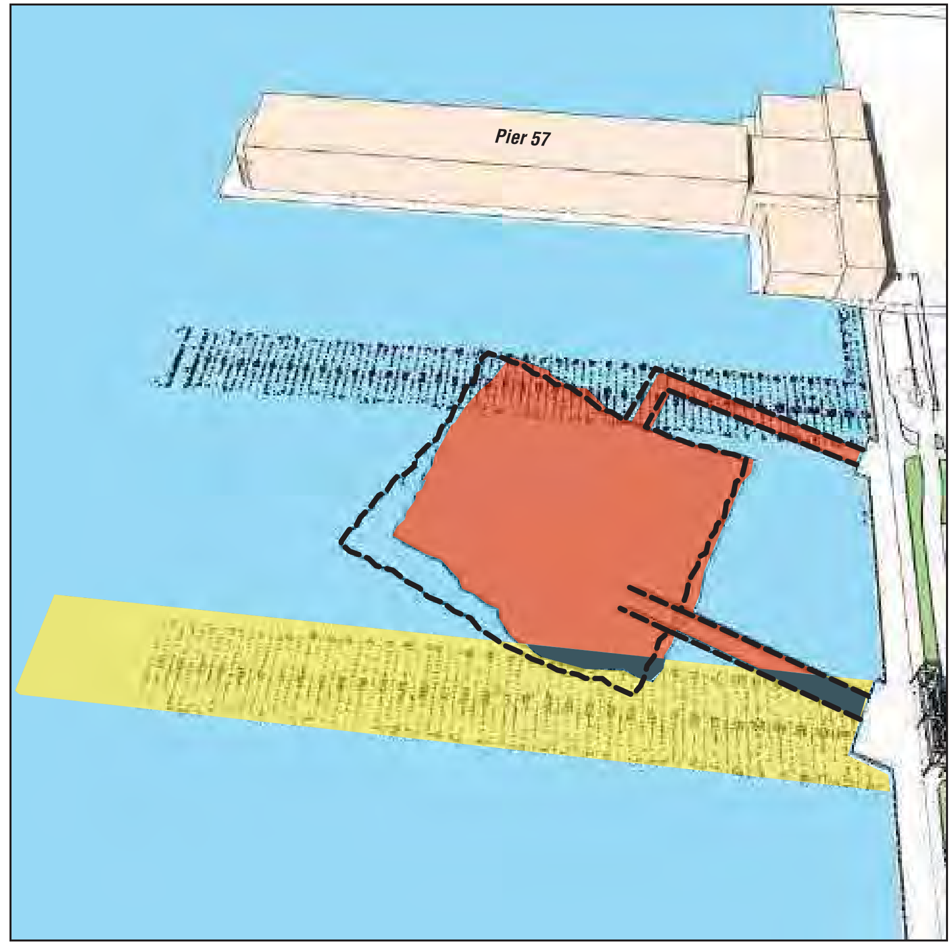


With Action Condition

Proposed Pier

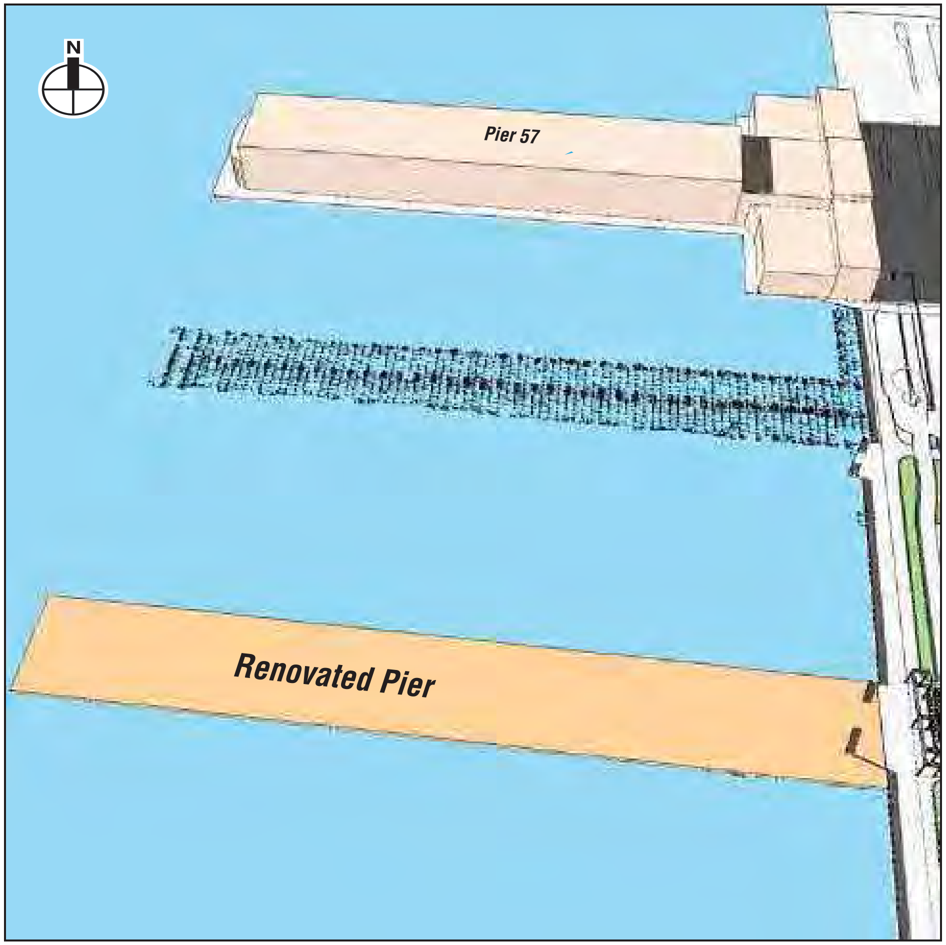
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

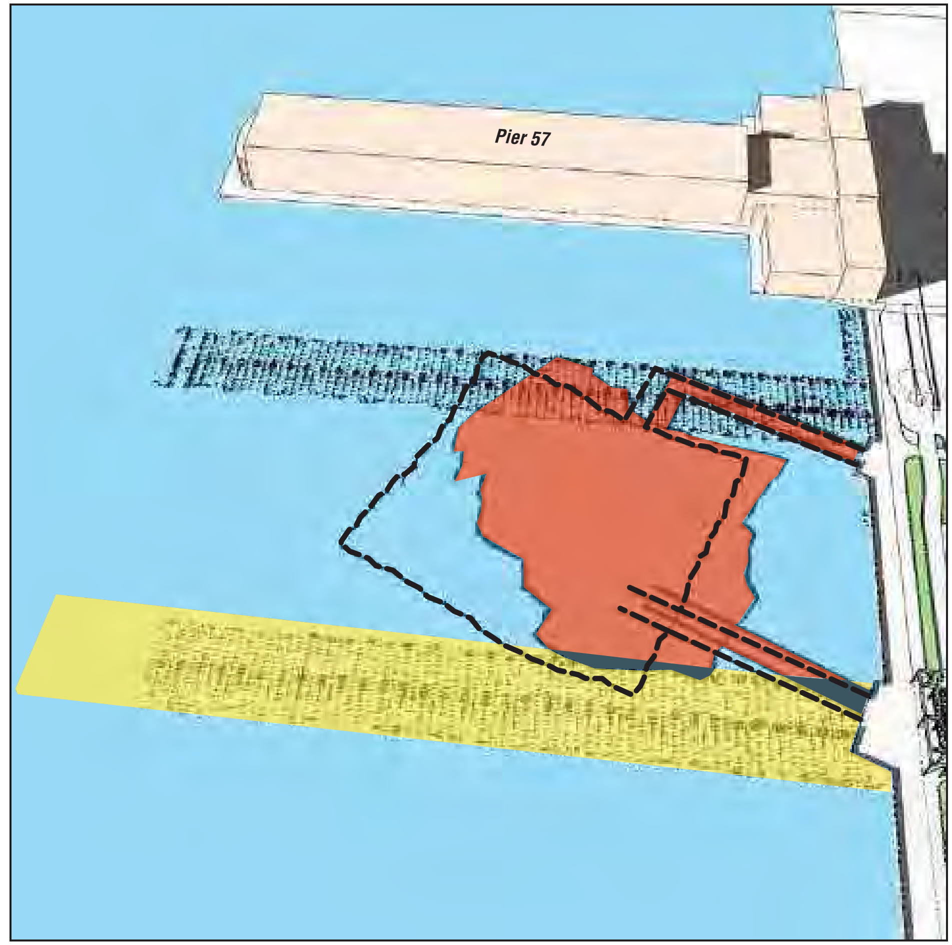
Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

May 6 / August 6—2:30 PM
Figure C-11

2.8.15



No Action Condition



With Action Condition

Proposed Pier

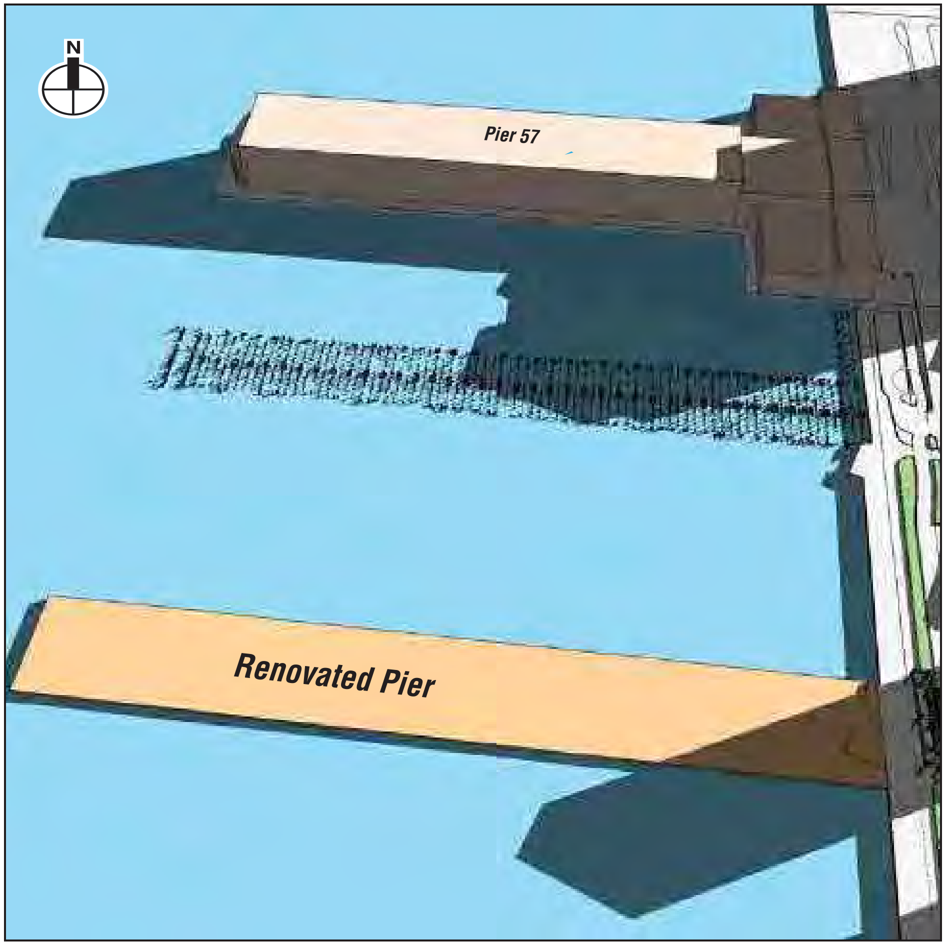
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

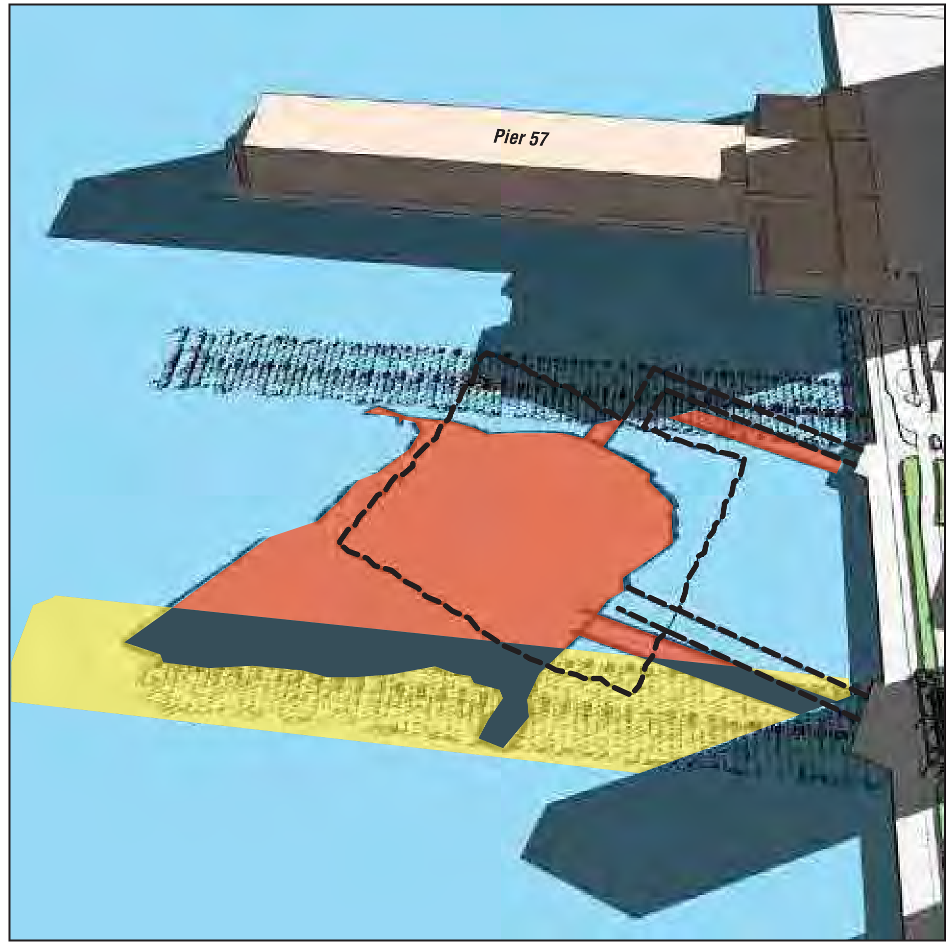
Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

May 6 / August 6—5:00 PM
Figure C-12

2.8.15



No Action Condition



With Action Condition

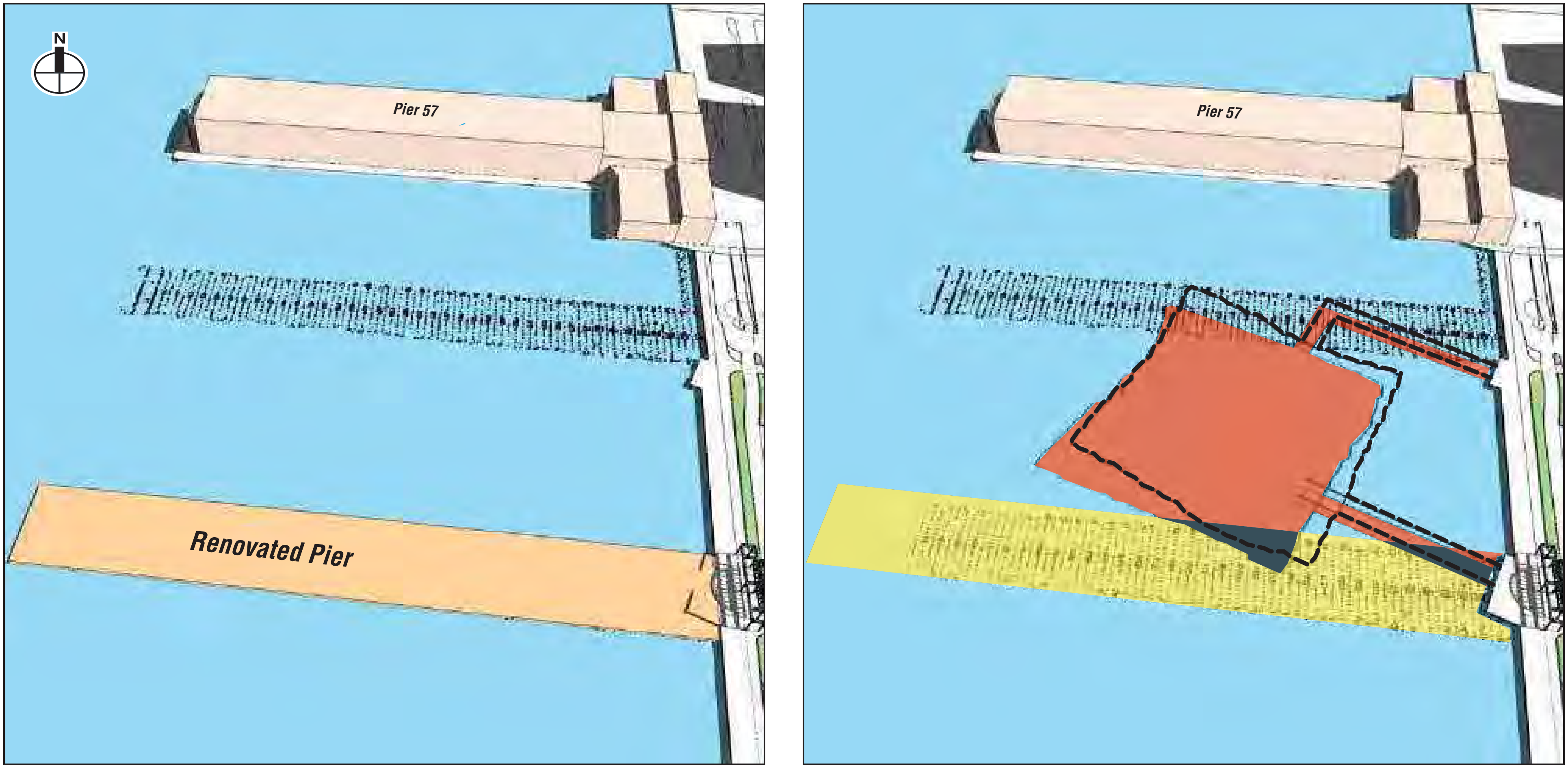
Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

June 21—6:00 AM
Figure C-13



No Action Condition

With Action Condition

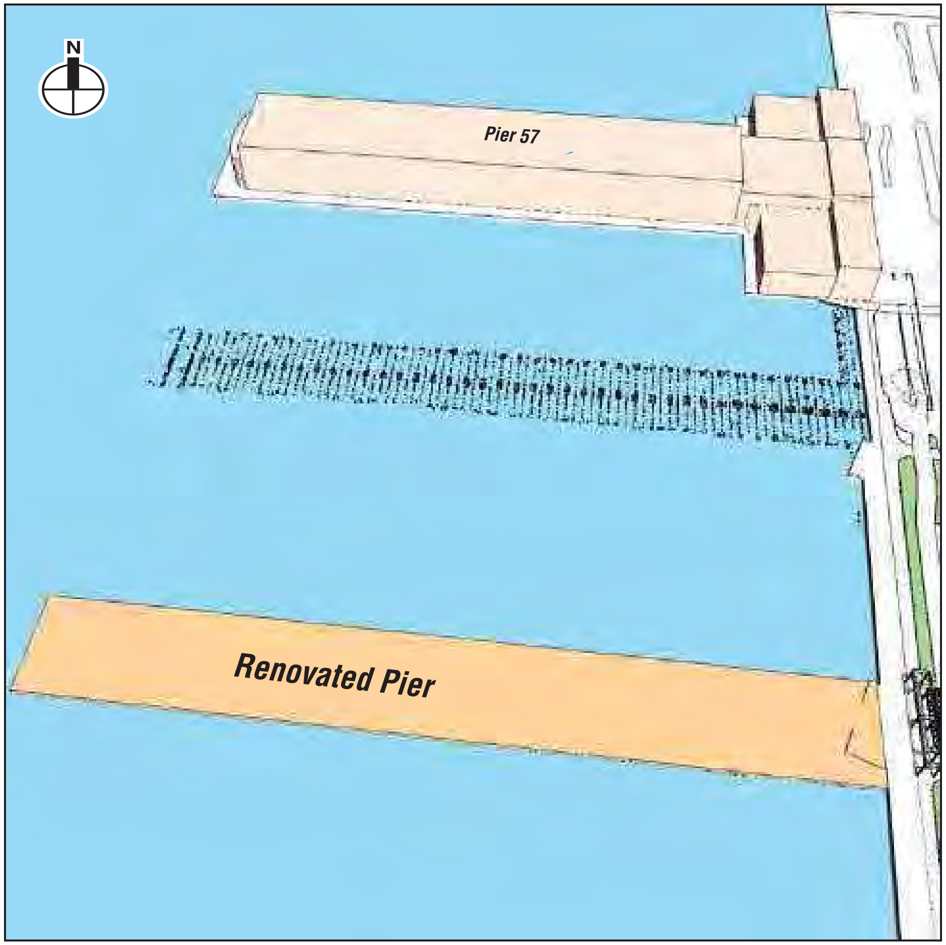
Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

June 21—9:00 AM
Figure C-14



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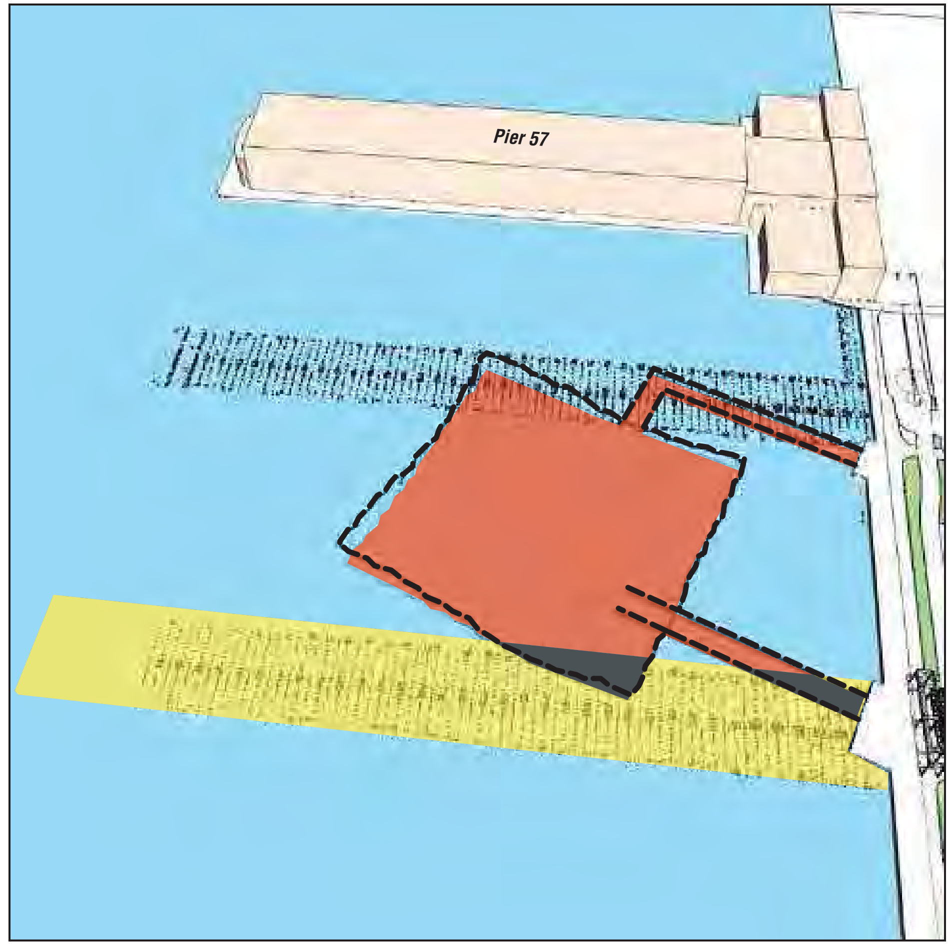


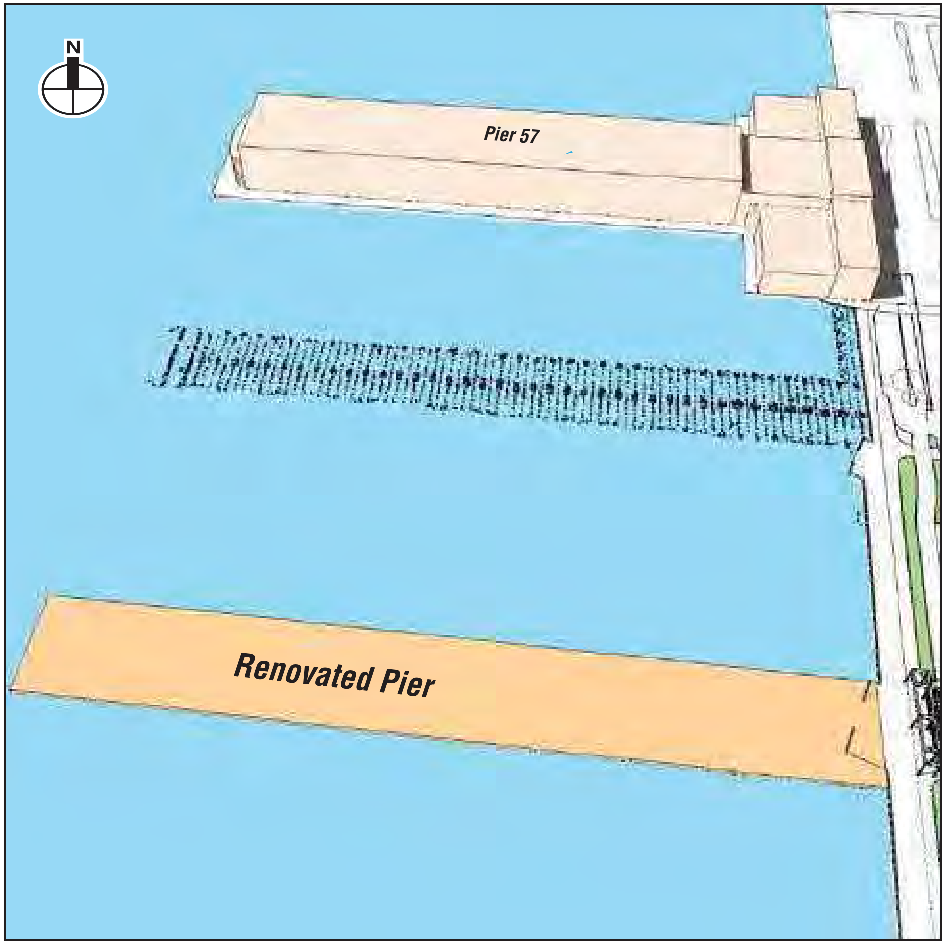
With Action Condition

- - - - *Proposed Pier*

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.



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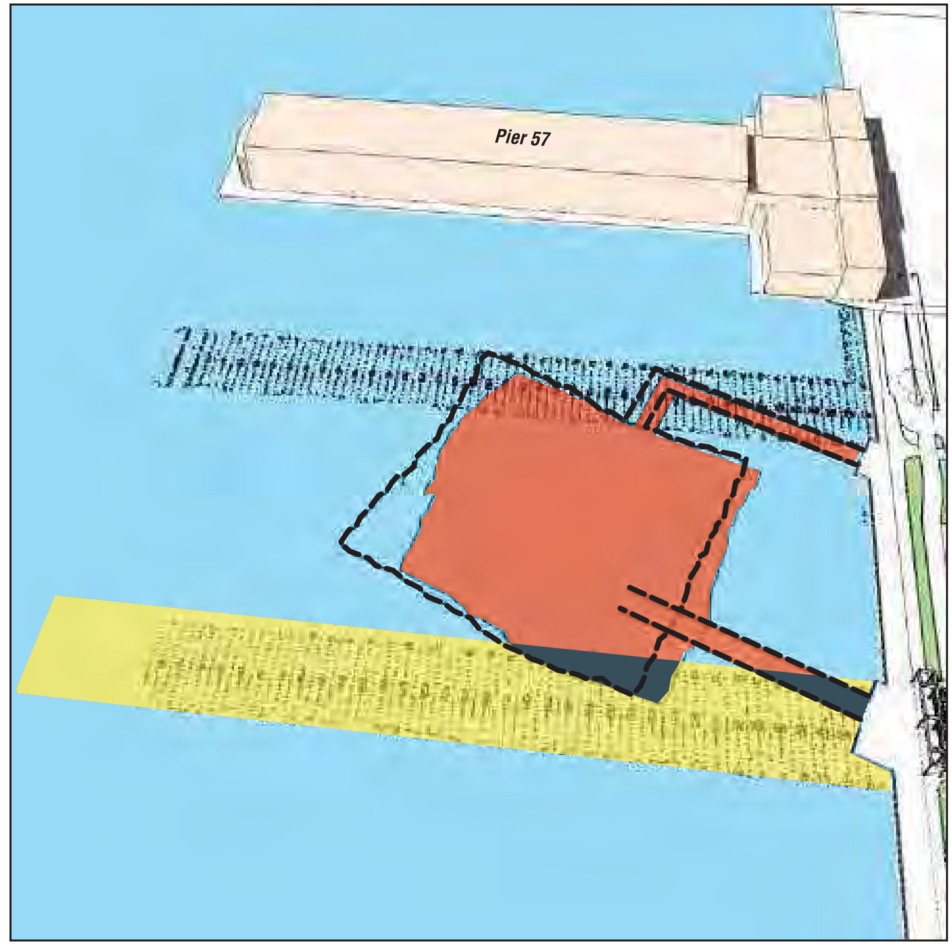


With Action Condition

Proposed Pier

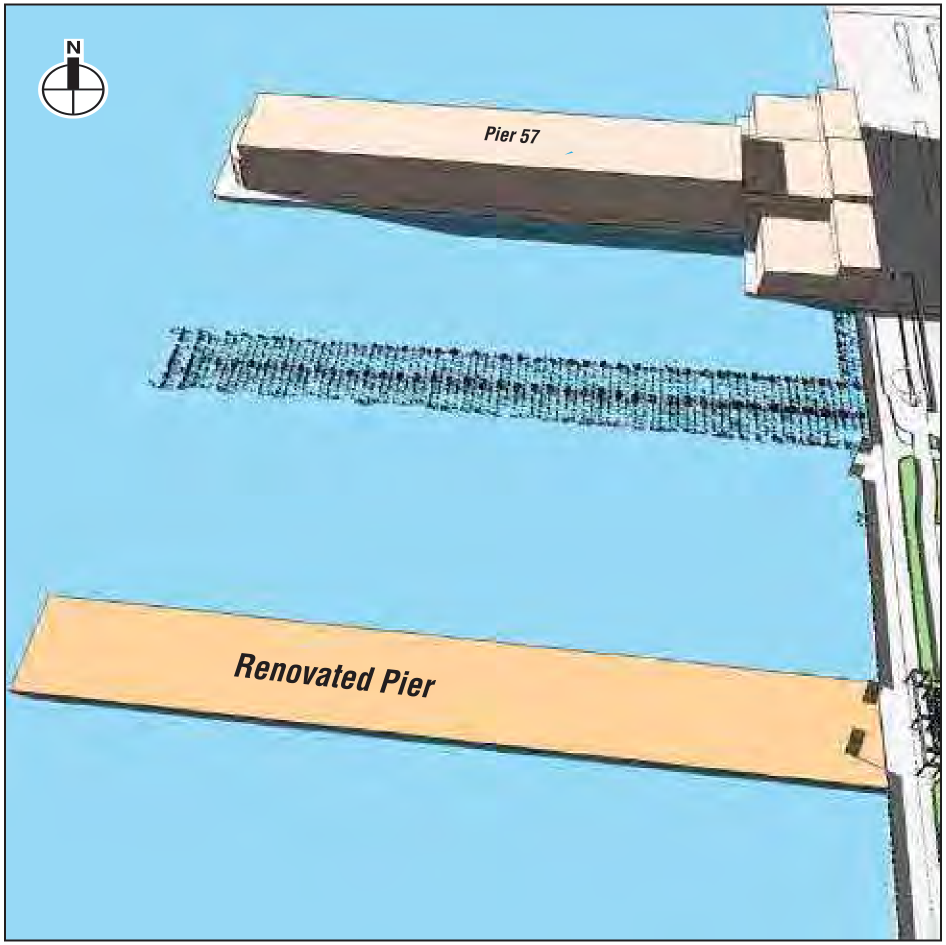
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

June 21—3:00 PM
Figure C-16

2.8.15



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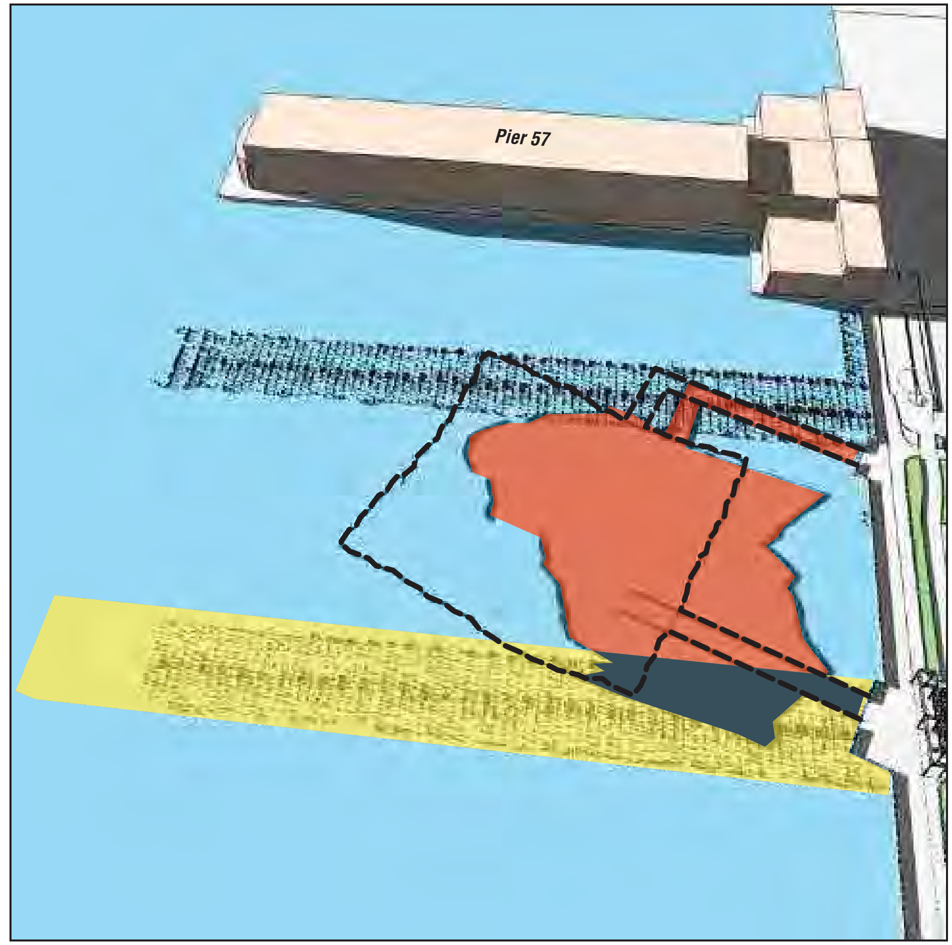


With Action Condition

Proposed Pier

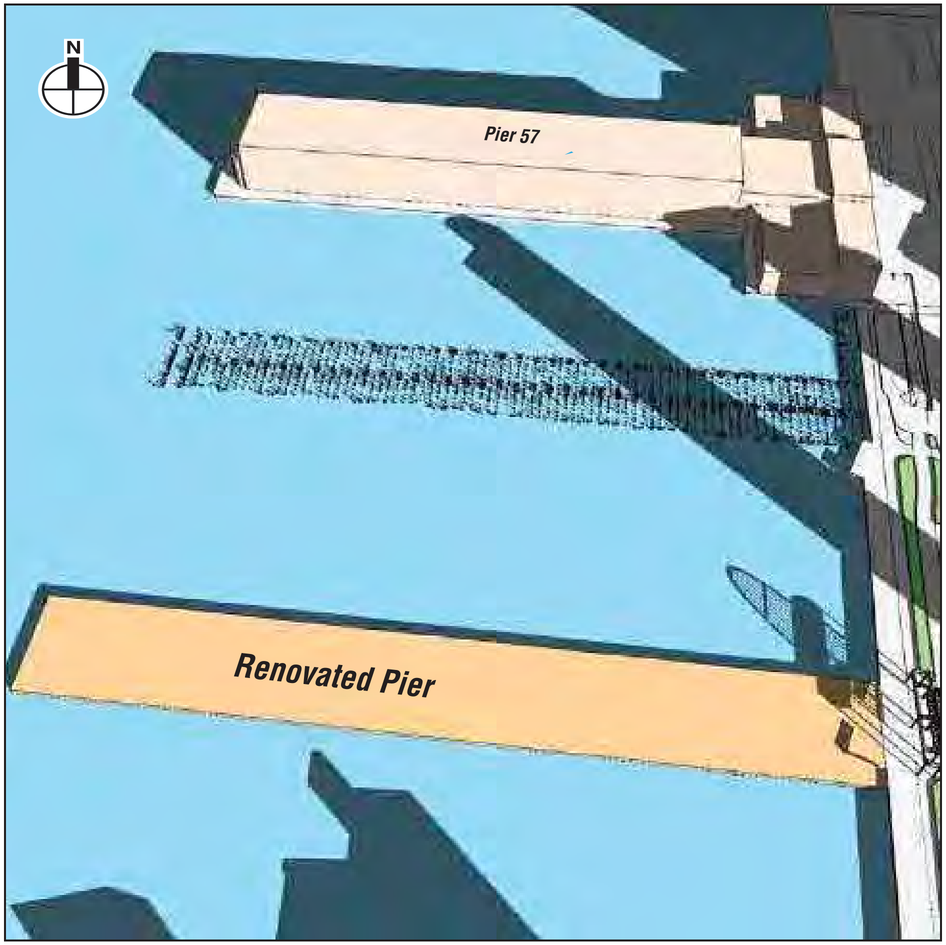
Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

June 21—6:00 PM
Figure C-17

2.8.15



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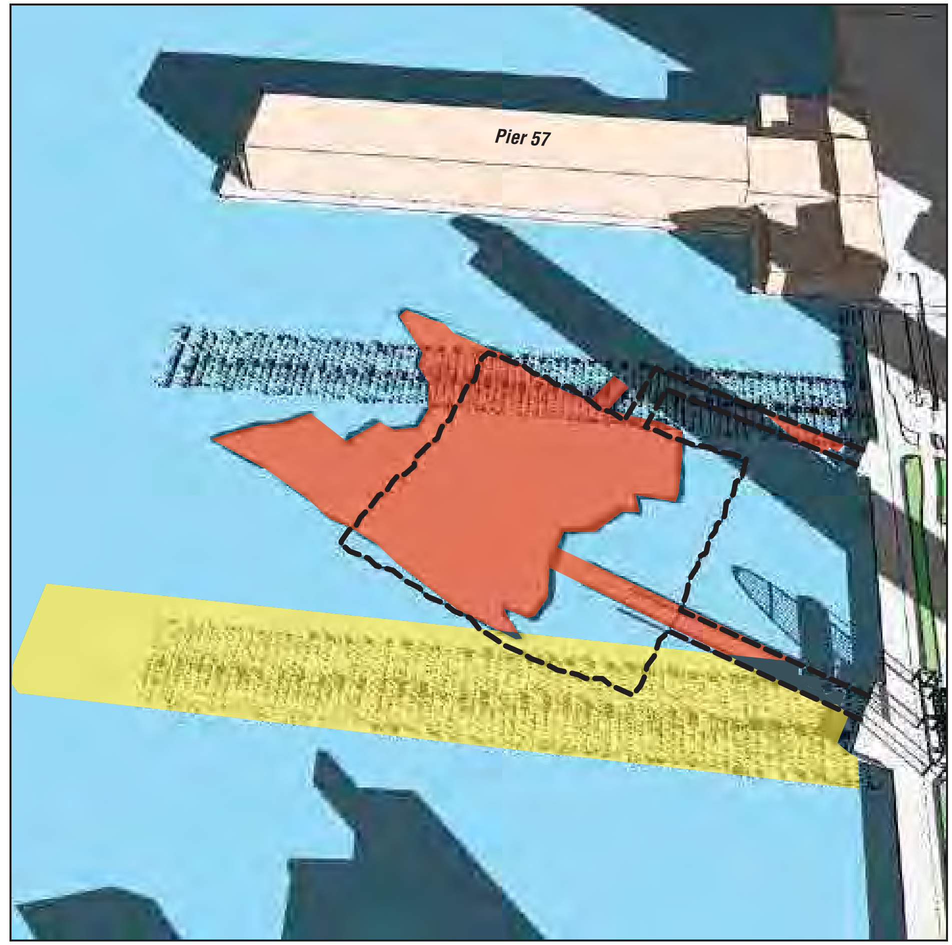


With Action Condition

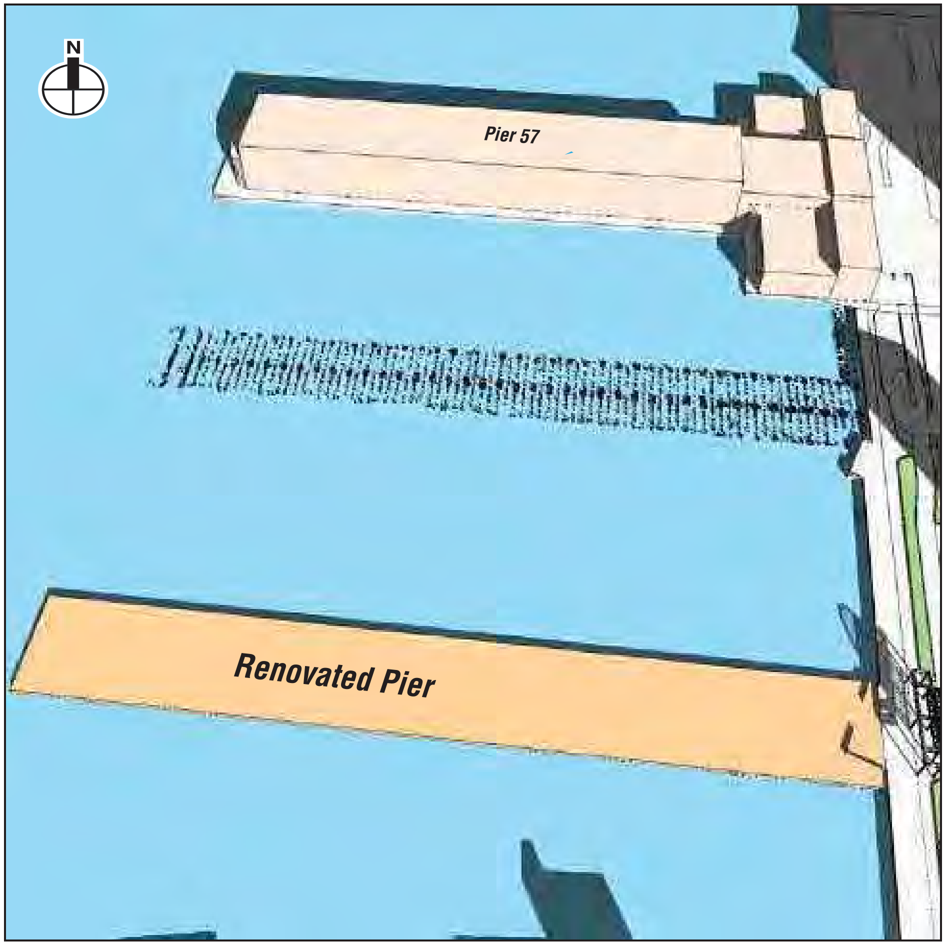
Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

December 21—9:00 AM
Figure C-18



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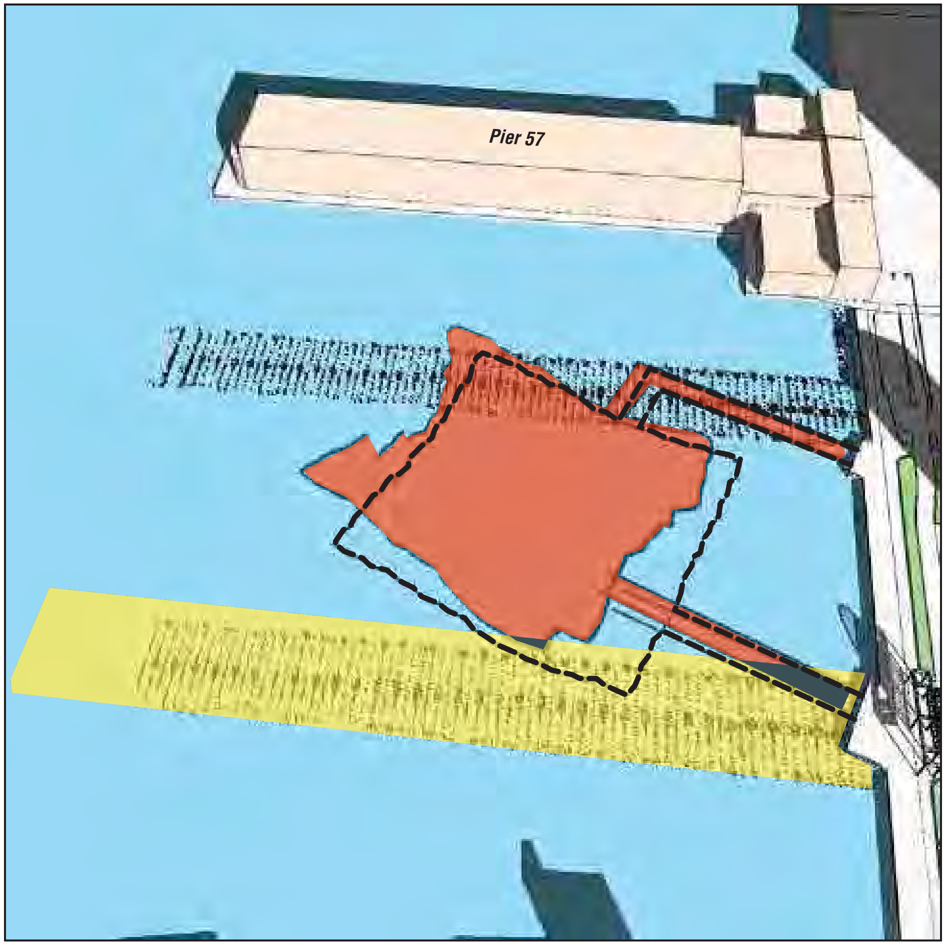


With Action Condition

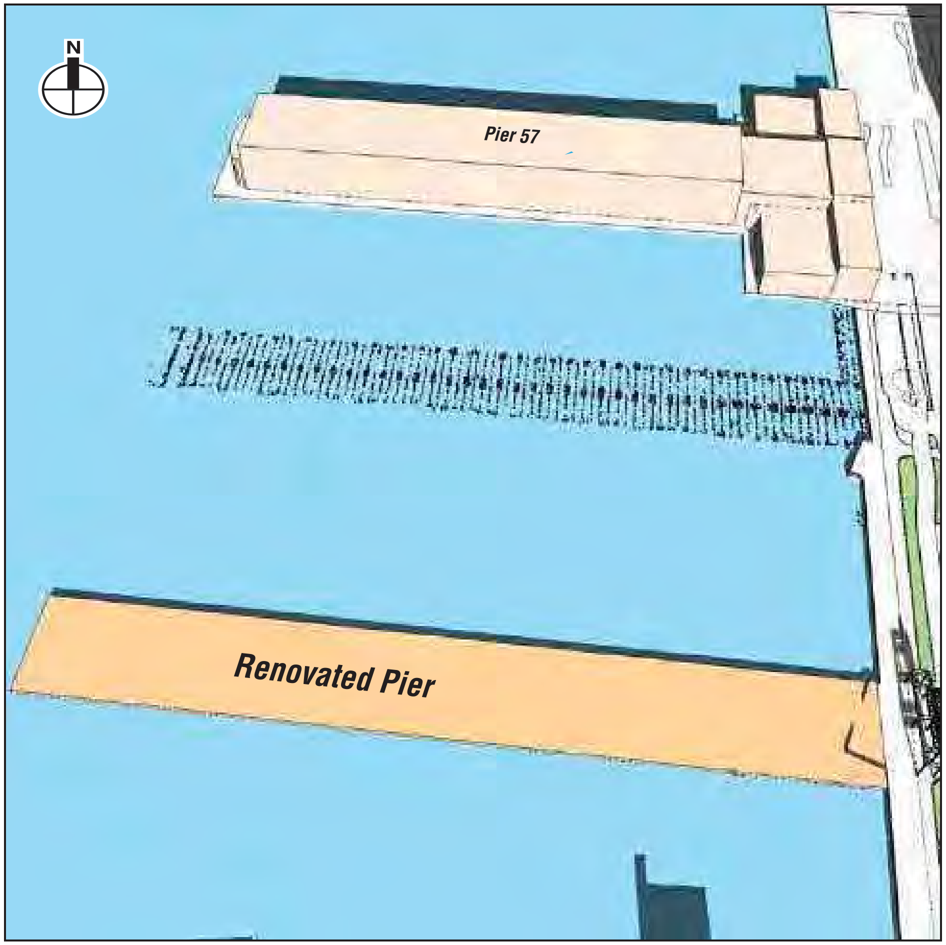
Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

December 21—10:30 AM
Figure C-19



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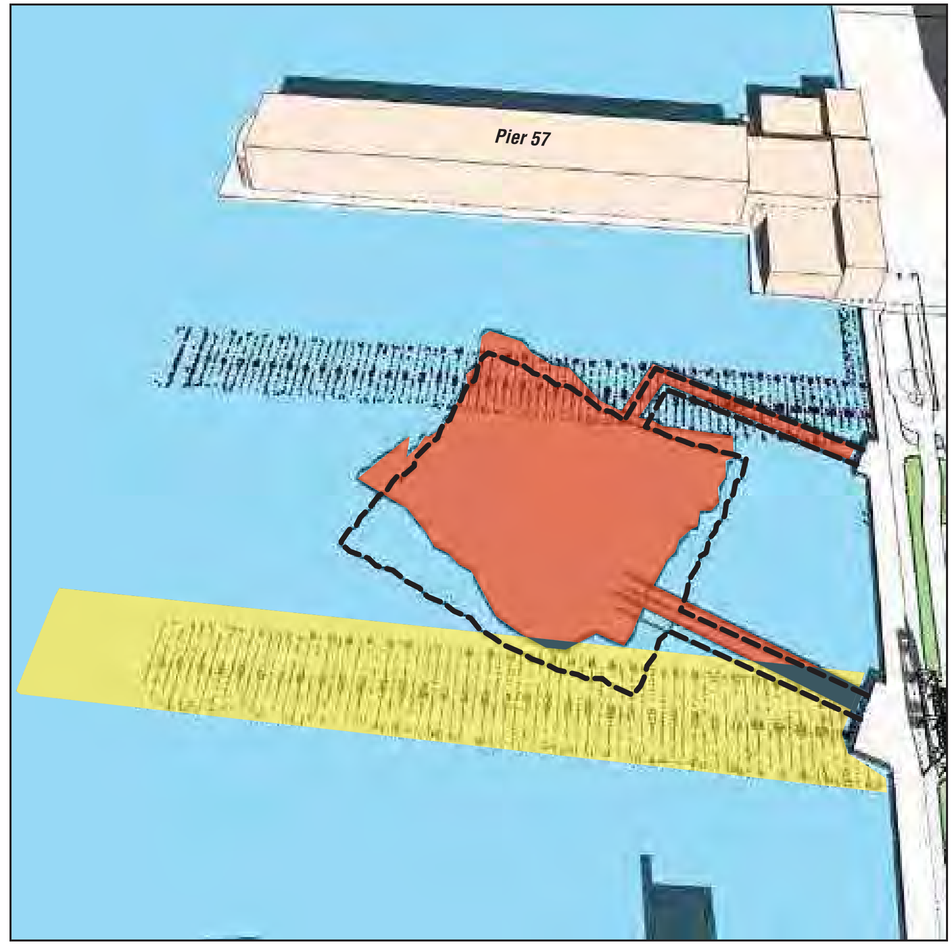


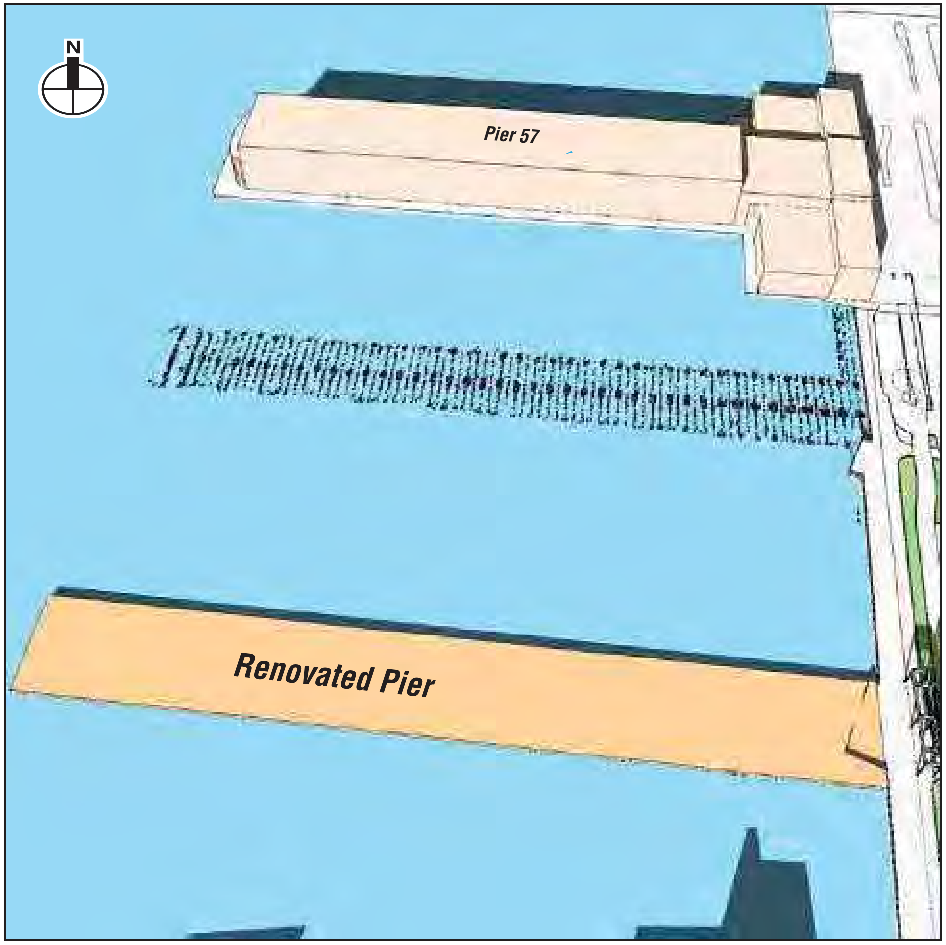
With Action Condition

- - - - *Proposed Pier*
Incremental Shadow on River
Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

December 21—12:00 PM
Figure C-20

2.8.15



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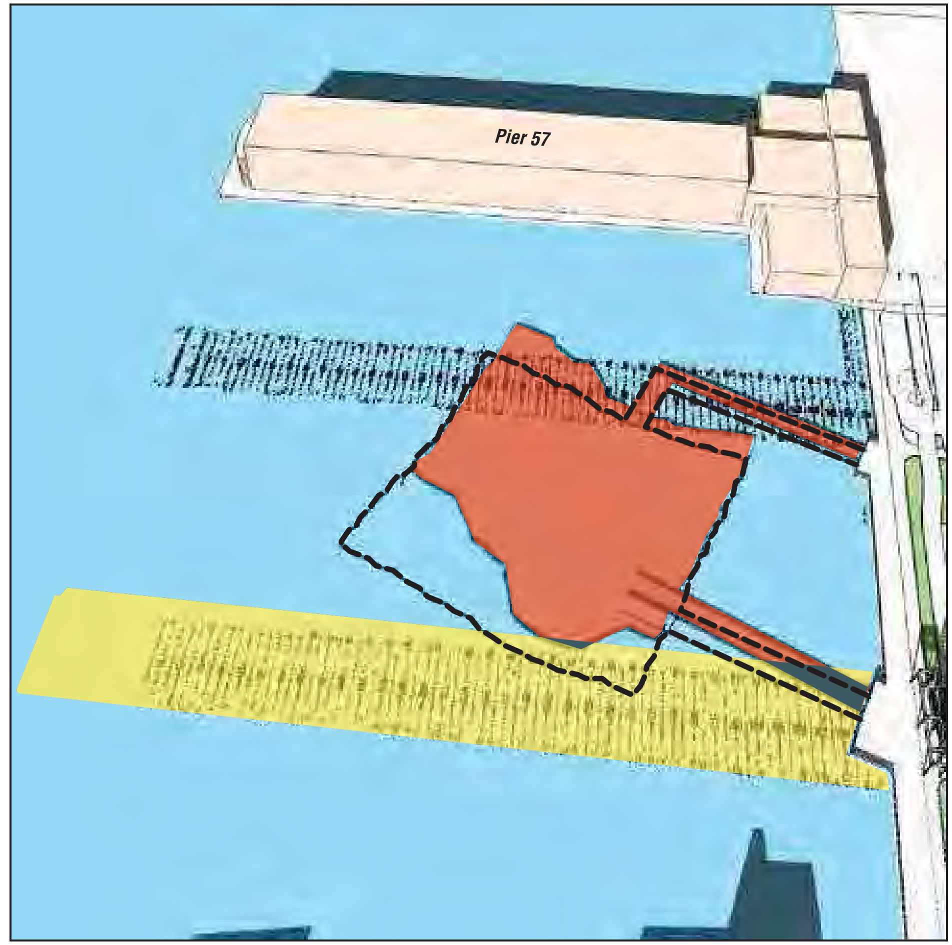


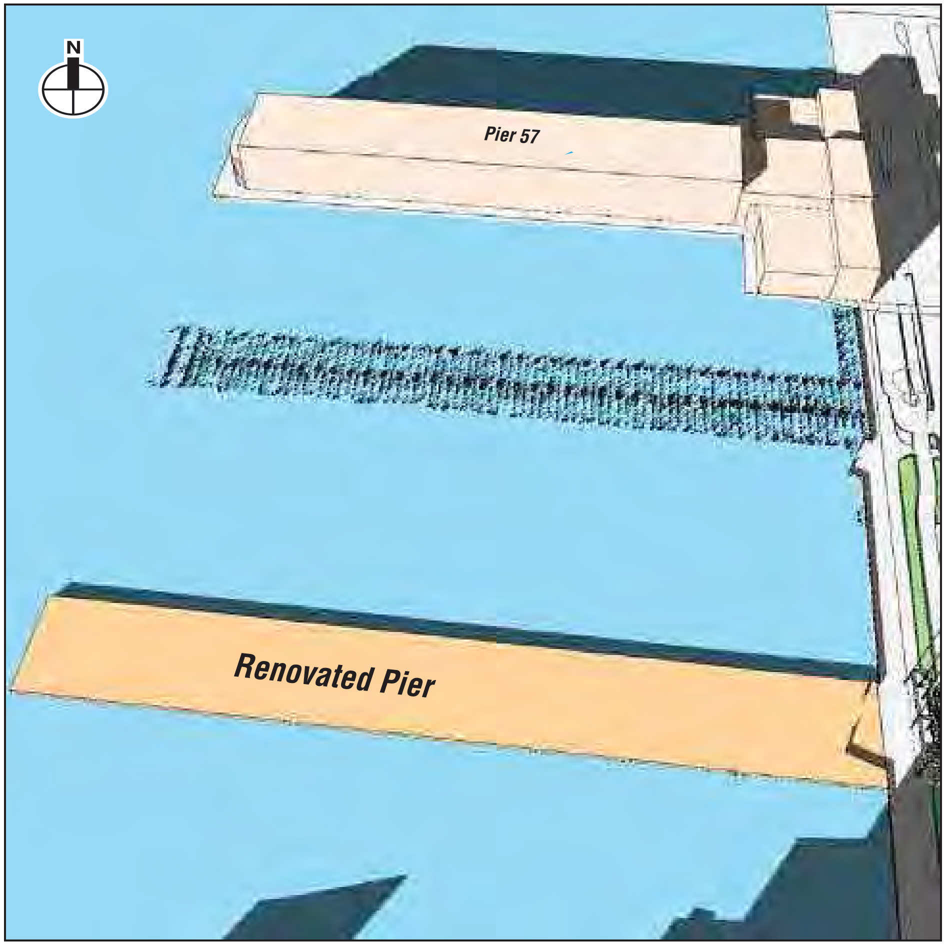
With Action Condition

Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.



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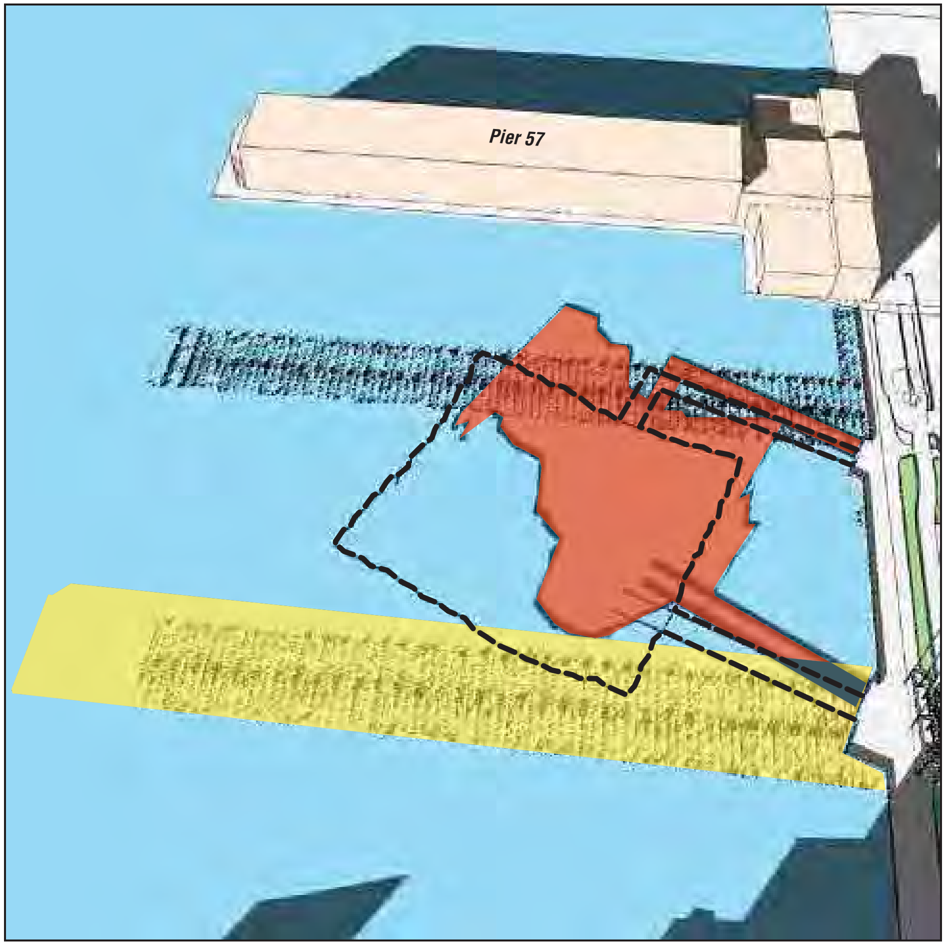


With Action Condition

Proposed Pier

Incremental Shadow on River

Reduced Shadow (Compared with No Action) on River

Daylight Saving Time was not used, per *CEQR Technical Manual* guidelines.

December 21—2:53 PM
Figure C-22

pier would be constructed immediately above the water surface. The overall effect of the proposed pier's higher elevation would offset its larger footprint and would result in a net improvement in light penetration to the water surface relative to the No Action pier.

As shown in the figures, direct sunlight would reach underneath portions of the elevated proposed pier, particularly during early morning and late afternoon in all seasons when the sun is closer to the horizon and for much of the day in winter when the arc of the sun is lower in the sky. As a consequence, only an area less than half the square footage of the proposed pier structure and walkways would be shaded in the way typical of traditional overwater structures (i.e., would receive virtually no direct sunlight)[1]. This area would be approximately under the center and center-northeast of the structure. The rest of the areas under the elevated pier, around the edges, and particularly under the southern half of the structure, would receive direct sunlight for some hours of the day.

In the No Action scenario, the pier deck over the reconstructed Pier 54 would cast continuous shadow (i.e., less than 1 hour of direct sunlight per day) at virtually all times due to its close proximity to the water surface. Without this pier deck, and as a result of its elevated pier configuration, at the southwest corner in particular, the proposed project would reduce the surface area subject to continuous shadow, from approximately 84,300 square feet in the No Action condition to approximately 39,000 square feet with the proposed project (on the March 21 analysis day).

Further, river currents move phytoplankton and other natural elements through the shaded areas, and fish move through different areas of the river. The shadows that would be cast adjacent to the proposed pier, by the higher elevations, would move over the course of the day as shown in the figures, falling on some areas in the morning, others during midday, and still others in the afternoon. The areas of the river that would receive the longest durations of new shadows would continue to receive ample sunlight in the midday and afternoon, because there are no intervening structures to the west. Given all these factors, the proposed pier would not have the potential to cause significant adverse shadow impacts to aquatic habitat. The access ramps that connect the pier to the mainland access ramps are narrow and raised above the water surface and would therefore permit some light to reach the water under them. Therefore, these walkways would not result in significant adverse impacts to habitat from shading. For additional discussion of the potential effects of shading on aquatic life with the proposed project, see Attachment F, "Natural Resources." ✷

[1] The size of this area would vary based on season. On March 21 (equivalent to September 21, the equinoxes) computer simulation modeling determined that the area of the water surface under the proposed pier that would receive between 0 and 1 hour of sunlight would be approximately 39,000 square feet.

A. INTRODUCTION

This section considers the potential for the proposed Pier 54 Redevelopment project to affect historic and cultural resources on or near the project site, which is generally located at the foot of West 13th Street within Hudson River Park (see **Figure D-1**). The proposed project would construct a new public park pier located between the existing Pier 54 footprint and the Pier 56 pile field to the north. It would also include retaining the piles at the existing Pier 54 footprint to create a pile field.

PRINCIPAL CONCLUSIONS

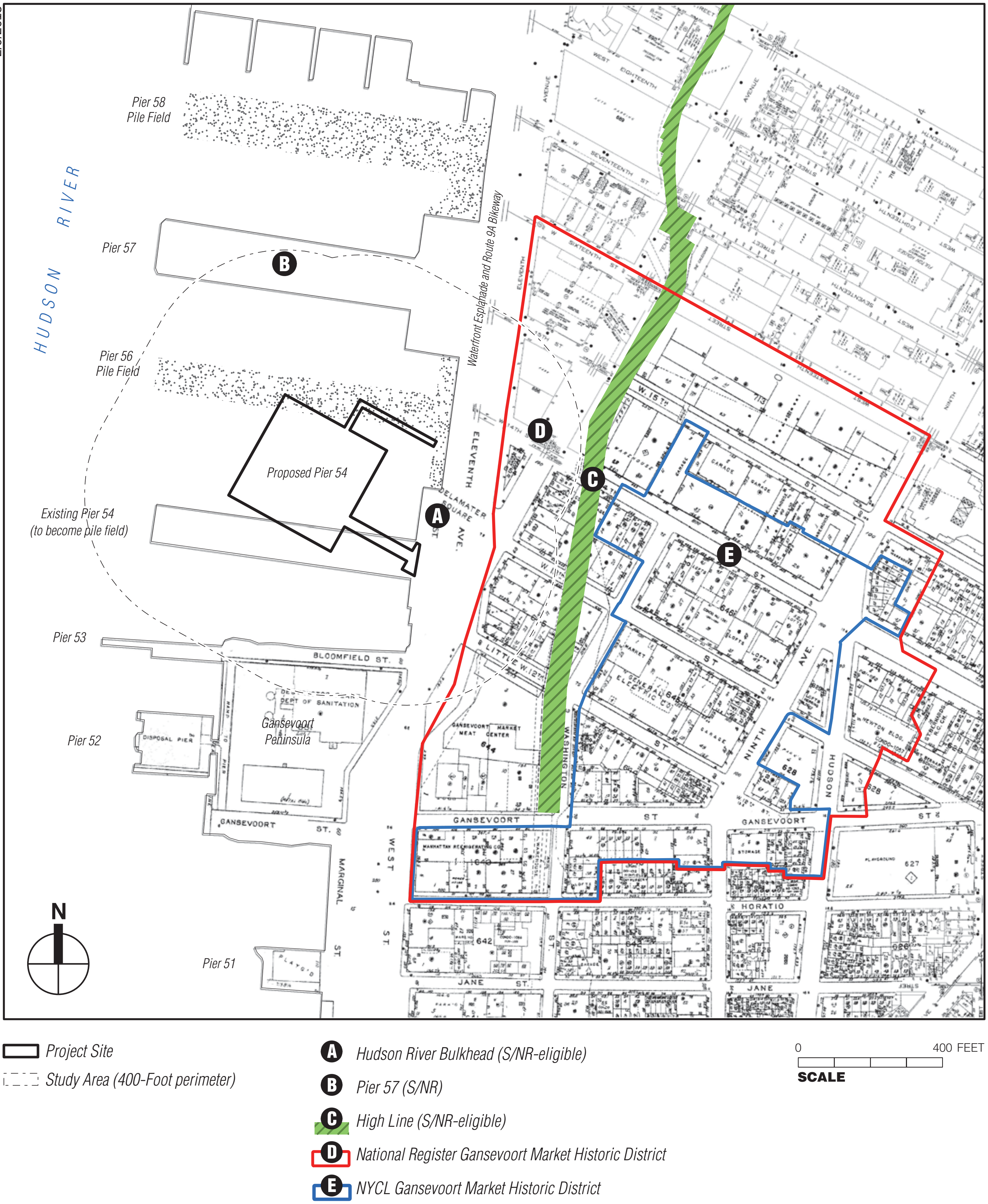
Overall, the proposed project would not result in any significant adverse impacts to historic and cultural resources. A construction protection plan would be developed and implemented to avoid adverse construction-related impacts on the Hudson River bulkhead. In terms of potential visual and contextual impacts, the proposed project would not isolate any architectural resources from or significantly alter their setting or visual relationship with the streetscape, nor would it introduce incompatible visual, audible, or atmospheric elements to the setting of any architectural resource nor eliminate any publicly accessible views of any architectural resource. Further, the new pier would not introduce significant new shadows over a historic landscape or on a historic structure with sunlight-dependent features.

B. METHODOLOGY

This analysis has been prepared in accordance with SEQRA, the New York State Historic Preservation Act of 1980 (SHPA), and Section 106 of the National Historic Preservation Act of 1966 (NHPA). These laws and regulations require that City, State, and Federal agencies, respectively, consider the effects of their actions on historic properties. This analysis also follows the guidelines of the *City Environmental Quality Review (CEQR) Technical Manual*.

ARCHAEOLOGICAL RESOURCES

The study area for archaeological resources is defined as the area where subsurface disturbance would occur, i.e., on the project site itself. As part of the environmental review undertaken for the Hudson River Park project, archaeological studies were prepared for the area between the walkway adjacent to Route 9A and the U.S. Pierhead line. These studies concluded that there was no potential for significant pre-contact or historic-period archaeological resources in the area that includes the project site. Therefore, this assessment focuses on architectural resources only.


Pier 58
Pile Field
HUDSON RIVER
Pier 57
Pier 56
Pile Field
Proposed Pier 54
Existing Pier 54
(to become pile field)
Pier 53
Pier 52
Gansevoort
Peninsula
Pier 51
Waterfront Esplanade and Route 9A Bikeway
N
A
B
C
D
E
Project Site
Study Area (400-Foot perimeter)
Hudson River Bulkhead (S/NR-eligible)
Pier 57 (S/NR)
High Line (S/NR-eligible)
National Register Gansevoort Market Historic District
NYCL Gansevoort Market Historic District
0
400 FEET
SCALE

ARCHITECTURAL RESOURCES

Study areas for architectural resources are determined based on an area of potential effect for construction-period impacts, such as ground-borne vibrations, and on the area of potential effect for visual or contextual effects, which is usually a larger area. The study area for visual or contextual effects of the proposed project has been defined as the area within 400 feet of the project site (see **Figure D-1**). This study area encompasses the area of potential effect for construction-period impacts, which as described in more detail below, is defined as the area within 90 feet of construction activities. This study area is consistent with the *CEQR Technical Manual* methodology, which sets forth that the size of the study area should be directly related to the anticipated extent of the action's impacts.

To assess the potential impacts of the proposed project, an inventory of architectural resources in the study area was compiled. In accordance with CEQR guidelines, the inventory includes all officially recognized architectural resources. These resources ("known architectural resources") are defined as National Historic Landmarks (NHLs); properties or districts listed on the State and National Registers of Historic Places (S/NR), or determined to be eligible for such listing; New York City Landmarks (NYCLs) and Historic Districts (NYCHDs); and properties that have been considered for designation ("heard") by the New York City Landmarks Preservation Commission (LPC) at a public hearing, calendared for consideration at such a hearing ("pending" NYCLs), or found by LPC to appear eligible for designation.

In addition to identifying known architectural resources, an evaluation of the study area was undertaken to identify any "potential architectural resources;" that is, other structures in the study area that could warrant recognition as architectural resources (properties that could be eligible for S/NR listing or NYCL designation). Properties were evaluated based on a site visit by an architectural historian, as well as a review of surveys conducted as part of the 1998 *Hudson River Park Final Environmental Impact Statement (FEIS)*. Identification of potential architectural resources was based on criteria for listing on the National Register as found in the Code of Federal Regulations, Title 36, part 60, and the LPC criteria for NYCL and NYCHD designation.

Once the architectural resources in the study area were identified, the proposed project was assessed for its potential to have direct, physical impacts and/or indirect visual or contextual impacts on architectural resources. Direct impacts include demolition of a resource, and alterations to a resource that cause it to become a different visual entity. A resource could also be physically damaged from adjacent construction, either from vibration (i.e., from construction blasting or pile driving), or from falling objects, subsidence, collapse, or damage from construction machinery. Adjacent construction is defined as any construction activity that would occur within 90 feet of an architectural resource, as defined in the New York City Department of Building's (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88*.[1]

Indirect impacts are contextual or visual impacts that could result from project construction or operation. As described in the *CEQR Technical Manual*, indirect impacts could result from blocking significant public views of a resource; isolating a resource from its setting or

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[1] *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

relationship to the streetscape; altering the setting of a resource; introducing incompatible visual, audible, or atmospheric elements to a resource's setting; or introducing shadows over a historic landscape or an architectural resource with sun-sensitive features that contribute to that resource's significance (e.g., a church with stained-glass windows).

The setting of each architectural resource, including its visual prominence and significance in publicly accessible views, whether it has sun-sensitive features, and its visual and architectural relationship to other architectural resources, was taken into consideration for this analysis.

C. EXISTING CONDITIONS

PROJECT SITE

Built in 1906 for the Cunard Steamship Company, Pier 54 consists of a concrete deck on timber pilings (see view 1 of **Figure D-2**). An iron arch is located at the eastern (landward) end of the pier (see view 2 of **Figure D-2**). At one time, a two-story steel shed was located on the pier, and the arch had a masonry façade. In 1991, the shed was demolished and the masonry façade was removed. However, before the demolition of the shed and removal of masonry from the arch, LPC and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) determined, as part of the environmental review of the Westway project in 1982, that Pier 54 did not have architectural significance. Pier 54 was most recently used as open space and as a venue for concerts, festivals, art installations, and other programs, but much of it was closed in 2013 because of its deteriorated pile and platform conditions.

The Hudson River bulkhead between Battery Place and West 59th Street has been determined eligible for listing on the Registers, and a portion of it is located within the project site. The bulkhead is significant under Criterion C in the area of engineering and under Criterion A in the areas of commerce or industry. New York City created a Department of Docks in 1870, and the department constructed the bulkhead and its associated structural systems between 1871 and 1936. The majority of the construction consisted of masonry walls on a variety of foundation systems, with quarry-faced ashlar granite block forming the visible face along most of the armored frontage. The portion of the bulkhead that traverses the project site was constructed ca. 1899–1915 and is granite wall on wider concrete blocks with piles and buried, timber relieving platforms.

Design of the bulkhead was the responsibility of George B. McClellan, a general during the Civil War who became the first Engineer-in-Chief of the Department of Docks. McClellan's plans contemplated the creation of a 250-foot-wide marginal street, from which 60- to 100-foot-wide piers with cargo sheds would project 400 to 500 feet around 150- to 200-foot-wide slips. Initiated to address the deteriorated, congested, and silt-filled condition of the waterfront, the carefully built granite walls created a consistent and monumental surface to the waterfront that reinforced an image of the City's commercial prominence. As property was acquired and as commerce warranted, the City built the bulkheads, built or rebuilt pier substructures, and leased redeveloped areas to private companies that were usually responsible for pier shed and headhouse construction. Throughout its history, the Hudson River bulkhead has been built and reconstructed in segments in response to changing needs, and since the end of World War II, a variety of repairs has been made to the bulkhead walls, often without any attempt to create a uniform appearance.

Existing Pier 54 **1**

Pier 54 Arch **2**

Architectural Resources
Project Site
Figure D-2

STUDY AREA

As described below, three known architectural resources are located in the project study area: Pier 57, the High Line, and the Gansevoort Market Historic District. West Street (Route 9A) acts as a physical and visual barrier between the project site and the Gansevoort Market Historic District and the High Line. No potential architectural resources were identified in the project study area.

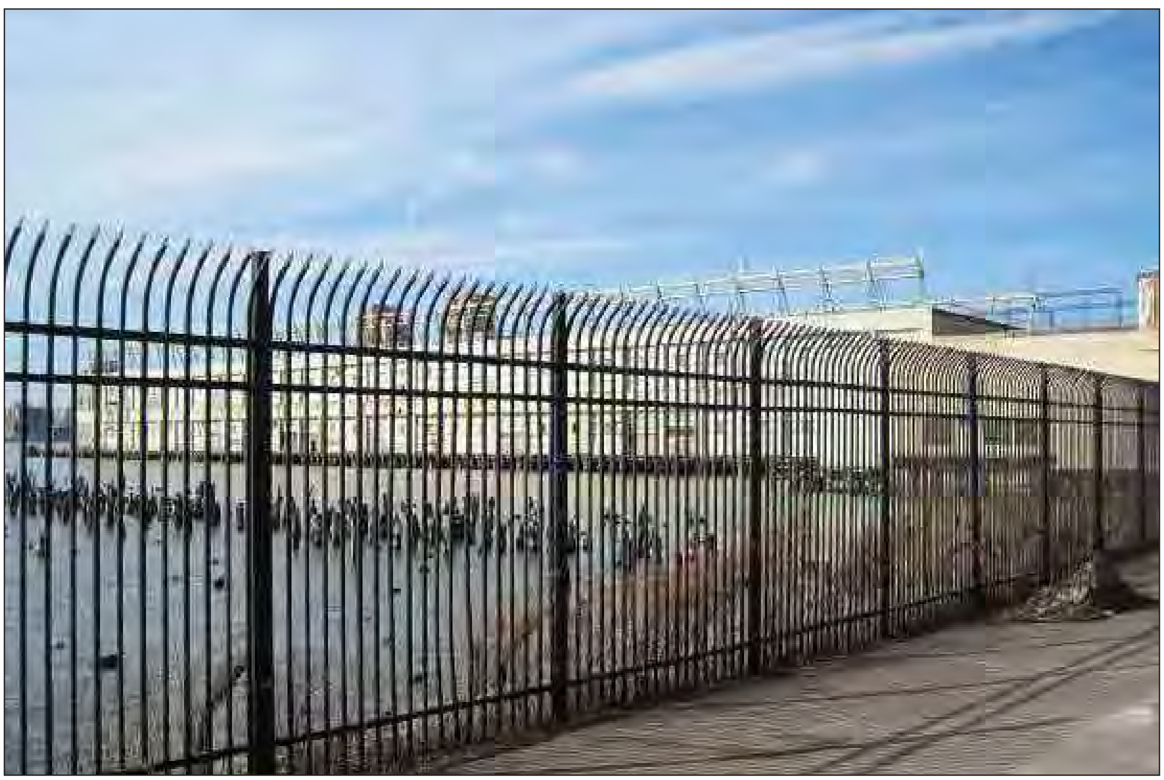
PIER 57 (S/NR)

Constructed as an ocean liner pier in 1950–1954 at the foot of West 15th Street, Pier 57 is significant for its innovative engineering design. In response to the limited load-bearing capacity of the silt at the river bottom, as well as the presence of timber piles remaining from an earlier pier that was destroyed by fire, Pier 57 is supported primarily by the buoyancy of three hollow concrete boxes that form the superstructure of the pier and the headhouse. These sections were constructed 38 miles upriver in Haverstraw, NY, and are each 360 feet long, 82 feet wide, and 34 feet high. They contain 2,000 tons of reinforcing steel and weigh 27,000 tons. When finished, the construction site was flooded, and the sections were floated down the Hudson River to be installed on a sand and gravel mat. Prominent civil engineer Emil Praeger designed the innovative structure, inspired by his World War II design for floating concrete breakwaters that were constructed in England and floated across the English Channel to form a protected harbor for the invasion of Normandy. Pier 57 was widely publicized in engineering journals of the time for its unusual construction, and it continues to be seen by the profession as a significant innovation in the design of underwater foundations. The pier's structural system is unique within New York City and has never been repeated for a shipping pier in the city.

The pier's rectangular-plan, flat-roofed headhouse (also known as the bulkhead shed) faces onto West Street and has a steel frame with a brick façade. The east elevation of the headhouse is clad in brick with stone trim at the window openings (see view 3 of **Figure D-3**). The first floor has regularly spaced door openings with rolling metal shutters. The central section of the headhouse is notable for its bank of tall window openings. The building name Marine & Aviation Pier 57 appears in stainless steel lettering above this opening. Wings extend to the north and south of the central section; these wings feature horizontal bands of windows at the upper floors. The north and south-facing elevations of these wings were historically attached to the headhouses of adjacent piers along the Hudson River, which have since been demolished. Therefore, these party wall elevations, presently finished in cement plaster/stucco, were never intended to be seen. Until at least the 1980s, Pier 56 was located between Pier 57 and Pier 54. Constructed in 1906, it was similar in design and size to Pier 54, and prior to its demolition Pier 56 would have obstructed views of Pier 57 from the north and south.

The long, flat-roofed pier shed is two stories tall above a basement. The pier shed is of steel frame construction clad in metal, and is 32 bays long on the north and south sides (see view 4 of **Figure D-3**). Each bay along the pier shed has vertical lift doors on both the first and second floors, which allowed trucks to drive from the pier to load and unload freight from the ships. The bays on the north and south façades also feature regularly spaced steel sash. Attached along the roof edge on the north and south façades are metal frameworks originally used for cargo handling, referred to as "burtons." The roof was designed for the transfer and storage of bulky cargo, parking for cars, and landing space for helicopters. Currently, the roof is paved and includes two central stair and elevator bulkheads and two smaller stair bulkheads. A walkway extends around most of the pier shed's perimeter, but does not continue along the north and

Pier 57: View from High Line above West 14th Street **3**



Pier 57: View north from Hudson River Park **4**

south ends of the headhouse's wings, and thus does not connect to adjacent portions of Hudson River Park. The west end of the pier has rounded, streamlined corners clad in steel. The name Pier 57 appears in large stainless steel letters on the upper band.

Pier 57 remained in its original use until the late 1960s when Grace Lines relocated to New Jersey. It then became a bus depot for the Metropolitan Transit Authority. The 300,000 square foot pier has been vacant since 2004, but is currently planned for rehabilitation and redevelopment, as described below.

THE HIGH LINE (S/NR-ELIGIBLE)

The High Line is a former railroad viaduct on the West Side of Manhattan that was built in 1934 to carry freight on the New York Central Lines. Completed in 1934, the entire viaduct as it now stands between Gansevoort and West 34th Streets has been determined S/NR-eligible. The High Line was built between Clarkson and West 34th Streets as part of the West Side Improvement Project, which removed the New York Central freight railroad from the bed of West Street and Tenth Avenue and placed it on a new, below-grade railroad viaduct to minimize traffic conflicts at grade. In several locations, the High Line passed through buildings where loading platforms facilitated the transfer of goods. Operation of the High Line ended in the 1980s, when the southern section between Gansevoort and Clarkson Streets was demolished, leaving a jagged edge to the southern end of the structure where the trestle over Gansevoort Street was removed. The High Line has been turned into an elevated public open space; the section of it that is nearest to the study area between Gansevoort Street and West 20th Street opened in 2009.

The High Line runs above the eastern edge of the block between Gansevoort and Little West 12th Streets, crosses Little West 12th Street, and then diagonally traverses the blocks between Little West 12th and West 14th Streets, from which point it runs north along the east side of Tenth Avenue through the former Nabisco Company bakery buildings. Where the High Line crosses over streets, the steel trestles have a decorative appearance (see view 5 of **Figure D-4**). Above the trestle structure, there are parapets ornamented with recessed panels and decorative riveting. Railings on the parapets contain panels with raised diamond and square patterns. The railings are also ornamented with decorative riveting. As the High Line passes over blocks, it is supported on steel stanchions and has a more utilitarian appearance, with concrete parapets and simple tubular steel railings.

GANSEVOORT MARKET HISTORIC DISTRICT (S/NR, NYCL)

The S/NR Gansevoort Market Historic District consists of all or portions of approximately 19 blocks and is roughly bounded by West 16th Street, Ninth and Hudson Avenues, Horatio and Gansevoort Streets, and West Street (Route 9A) and Eleventh Avenue (see **Figure D-1**). The area street plan—which transitions between the typical Manhattan street grid and the older Greenwich Village street plan—is a contributing element to the historic district. An NYCL Gansevoort Market Historic District is located within the boundaries of the S/NR historic district, but no part of this NYCL district lies within the project study area (see **Figure D-1**). Only the westernmost portion of the S/NR Gansevoort Market Historic District is located within 400 feet of the project site.

Architecturally, the two historic districts are characterized by a unique mix of buildings constructed between the 1840s and 1940s. Although the districts consist of a range of building types and sizes from different historical periods that represent the area's changing uses, certain common features create an architectural cohesion. These features include the use of brick, a

High Line: View west on Little West 12th Street from Washington Street **5**

S/NR Gansevoort Market Historic District: View north on Washington Street from Gansevoort Street **6** general low-rise character, metal ground-floor canopies, multiple buildings designed by the same architects in historical revival styles, and Belgian block paving (see **Figure D-4**). The earliest buildings tend to be residential structures, many of which were later converted to commercial uses, but a few extant industrial structures date to the pre-Civil War era. After the Civil War, new buildings tended to be manufacturing and warehouse structures. In the late 19th century, the creation of two markets spurred new development, particularly of wholesale businesses that catered to the markets. Buildings constructed in the late 19th and early 20th centuries include market buildings, stables, warehouses, and loft buildings, as well as residential structures. In 1898, development of a cold storage warehouse and power plant at 521–527 West Street and 109–111 Horatio Street by the Manhattan Refrigerating Company, along with the installation of a system of underground refrigeration pipes that serviced 18 blocks, spurred the concentration of wholesale meat businesses in the district. As meatpacking became the most prominent district business, numerous older buildings were converted while new low-rise market buildings were constructed. Today, as many of the buildings are occupied by restaurants, boutiques, furniture stores, and nightclubs, many ground-level façades have been altered with large, plate-glass windows and modern façade treatments that clearly signal the new land uses in the area.

The wide and heavily trafficked West Street lies between the project site and the S/NR Gansevoort Market Historic District. Within the project study area, the contributing historic district building located closest to the project site is a three-story brick hotel (built 1908) located on a triangular site bounded by West 14th Street, Tenth Avenue, and West Street. Two notable new buildings are located within the S/NR historic district in the vicinity of the project site. Located across West Street from the project site, the 19-story (233-foot-tall) Standard Hotel occupies the block bounded by Washington Street, Tenth Avenue, West 13th Street, and Little West 12th Street. This wedge-shaped structure straddles the High Line on large concrete piers, and it is largely clad in glass (see view 6 of **Figure D-4** and view 7 of **Figure D-5**). To the southeast of the project site, the Whitney Museum of American Art is currently constructing a new museum facility on the block bounded by Little West 12th Street, Washington Street, Gansevoort Street, and West Street. This building is massed with canted façades, terraces, cantilevers, and a height that steps up from 63 feet adjacent to the High Line to 175 feet facing West Street (see view 8 of **Figure D-5**).

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

PROJECT SITE

In the No Action condition, Pier 54 would be rebuilt as a public open space in its current footprint. A similar type deck as that currently on the pier would be installed on top of several hundred new piles that would be required to support the pier structure. Most of the existing timber piles would also be retained but would not have a structural function. Rebuilding the existing pier and restoring it to public use would not have visual or contextual effects on surrounding architectural resources. The only architectural resource located within 90 feet of the existing pier is the Hudson River bulkhead, and any work that would affect the bulkhead would be done in accordance with the Hudson River Park Programmatic Agreement executed among the U.S. Army Corps of Engineers, the New York State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the Hudson River Park Trust (HRPT) on March 31, 2000.

Standard Hotel: View north on West Street from Gansevoort Street **7**

Whitney Museum of American Art: View east from West Street **8**

Architectural Resources

Study Area

Figure D-5

STUDY AREA

In the future without the proposed project, HRPT will complete the Pier 54 Connector Project. That project will enhance Hudson River Park between West 14th Street and the Gansevoort Peninsula through an improved and widened pedestrian walkway built on a new overwater pedestrian platform, improvements to the Route 9A bikeway alignment, a new lay-by area for a future public bus stop, and landscaping. As part of this project, the existing fences and masonry walls along the park edge would be removed and replaced with a more aesthetic and appropriately scaled railing. The Pier 54 arch will be retained in its existing location. HRPT will comply with the Programmatic Agreement described above because the platform would directly abut the bulkhead.

There are five projects under construction or planned in and around the 400-foot study area, four of which are located within the S/NR Gansevoort Market Historic District. These projects include the renovation of Pier 57; the new Whitney Museum of American Art described above; a commercial building at the northeast corner of Tenth Avenue and West 13th Street adjacent to the High Line; a 10-story commercial building at the northwest corner of Washington Street and West 13th Street adjacent to the High Line; and a retail building adjacent to the High Line at the northeast corner of Tenth Avenue and West 14th Street. The four projects located within the S/NR historic district will further change the character of the district's western edge where there are already multiple modern buildings and additions to historic buildings. Those four projects will also add new buildings along the alignment of the High Line.

There are plans to rehabilitate the historic Pier 57 and redevelop it with new uses and publicly accessible open space. As part of the rehabilitation activities, the pier's headhouse and water-side (foot house) façades would be restored. The rooftop of the pier shed would be redeveloped as a new, publicly accessible open space that would consist of open areas and a central pavilion. In addition, the existing perimeter walkway extending around most of the pier would be repaired and extended to connect with the existing Hudson River Park waterfront esplanade to the east of the pier. New public walkways would be constructed parallel to the existing bulkhead to widen the public park space. These new walkways would extend north and south just east of the headhouse. Overall, the redevelopment of Pier 57 would restore and rehabilitate the pier, introduce new uses, and add new features, such as the rooftop open space. As set forth in the 2000 Hudson River Park Programmatic Agreement, the project developer and HRPT are consulting with OPRHP regarding the modifications to Pier 57.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

PROJECT SITE

As described in Chapter 1, "Project Description," HRPT is proposing to redevelop Pier 54 and reopen it as a public park pier for use as both a general recreation s and cultural events space. The proposed project would construct a new public access pier with a different overwater footprint. The new Pier 54 would contain approximately 117,000-gross-square-feet of open space (including the access ramps) and would be generally located at the existing Pier 54 footprint where a pile field would be created and also between the current Pier 54 footprint and the Pier 56 pile field to the north, within Hudson River Park at approximately West 13th Street. The new pier would have two access ramps from the Hudson River Park waterfront esplanade, which will be improved in the No Action condition (as the Pier 54 Connector Project).

Unlike a typical pier with a rectangular footprint, the redeveloped Pier 54 would have a square footprint and would have a topographically contoured deck with elevated corners; it would be engineered as a rolling, natural landscape for passive recreation, occupied by lawns, planted areas of shrubs and trees, and paved walking and seating areas. The reconstructed pier would have three unenclosed performance areas that would be integrated into the topography of the proposed pier.

Aside from the program zones, the pier would be landscaped with a combination of grass, ornamental plantings, railings, decorative and safety lighting, pavement, and other elements of park design. Lawns would provide opportunities for passive recreation. The topography would provide multiple vantage points with views of the Hudson River, the historic Pier 57, Hudson River Park, and New York City.

The Pier 54 Connector Project will create a widened pedestrian walkway on a new overwater platform adjacent to the project site. As a result, construction of the access ramps to the new pier would not directly touch or affect the S/NR-eligible bulkhead. The new access ramps would connect with the widened overwater pedestrian platform, which would extend beyond the existing bulkhead line within previously permitted limits.

To avoid inadvertent construction-related impacts on the Hudson River Bulkhead during construction of the proposed project, a construction protection plan would be prepared and implemented in consultation with OPRHP for the portions of the bulkhead that are located within 90 feet of project construction, close enough to be inadvertently damaged by construction activities. The construction protection plan would include measures to ensure that the bulkhead is not affected by ground-borne construction vibrations or other potential construction-related issues. The construction protection would follow the guidelines established in section 523 of the *CEQR Technical Manual*, including conformance with LPC's *New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark* and *Protection Programs for Landmark Buildings*. The construction protection plan would also comply with the procedures set forth in the New York City Department of Building's *Technical Policy and Procedure Notice (TPPN) #10/88*, regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction and which "requires a monitoring program to reduce the likelihood of construction damages to adjacent historic structures and to detect at an early stage the beginnings of damage so that construction procedures can be changed," and would also consider guidance provided in the National Park Service's *Preservation Tech Notes, Temporary Protection Number 3: Protecting a Historic Structure during Adjacent Construction*. Therefore, the proposed project is not anticipated to have any significant adverse impacts on the Hudson River Bulkhead.

STUDY AREA

None of the architectural resources in the study area is close enough to the proposed project (within 90 feet) to experience direct, physical impacts from construction.

Although the proposed project would add a new visual element to the setting of Pier 57, the Gansevoort Market Historic District, and the High Line, the proposed project would not isolate any of those architectural resources from or significantly alter their setting or visual relationship with the streetscape, nor would it introduce incompatible visual, audible, or atmospheric elements to the setting of any architectural resource nor eliminate any publicly accessible views of any architectural resource. Further, the new pier would not introduce significant new shadows over a historic landscape or on a historic structure with sunlight-dependent features.

The proposed project would be a new visual element in the setting of Pier 57, but the pier's historic context has already been altered by the demolition of Pier 56 and the shed on Pier 54 and by the recent construction of modern buildings within the westernmost portion of the S/NR Gansevoort Market Historic District that include the Standard Hotel and the new facility of the Whitney Museum of American Art. Further, the appearance of Pier 57 itself will be altered in the future without the proposed project through the creation of open space and a pavilion on the roof of the pier shed. While the new Pier 54 would be located just to the south of Pier 57 and would partially obstruct some views of the historic pier from the Hudson River Park bike and pedestrian path from south of the project site, these obstructed views would not result in a significant adverse impact. Historically, the former Pier 56 structure would have obstructed views of the Pier 57 pier shed and southern façade of the headhouse. The new pier's footprint would be separated from the westernmost edge of the future Pier 54 Connector project overwater pedestrian platform by approximately 135 feet, which would preserve northward views of Pier 57 along Hudson River Park and West Street. The topography of the new pier would also allow views to Pier 57. From farther south, the Department of Sanitation facility on the Gansevoort Peninsula and the bend in Route 9A currently block views of Pier 57. With the proposed project, views of Pier 57 would vary along Hudson River Park and West Street and would continue to be available from its immediate vicinity and from the east side of West Street and Tenth Avenue. In addition, Pier 54 would provide new, publicly accessible views of the historic Pier 57.

The new Pier 54 would have a limited visual and contextual relationship with the Gansevoort Market Historic District and the High Line and would not result in indirect adverse impacts on those architectural resources. As described above, West Street acts as a barrier between the project site and those two architectural resources. From most locations within the historic district, there would be no views of the new pier due to intervening buildings and the High Line. (See Attachment E, "Urban Design and Visual Resources" for a more thorough discussion of views and view corridors and for illustrative views of the proposed project from within the study area.) From where Pier 54 would be visible within the historic district—the westernmost edge west of the High Line—it would be one of many recently built structures in the area. From the High Line, the new pier would be visible from some locations, such as from West 14th Street, but it would be seen in context with the Standard Hotel and other modern buildings lining the High Line and with the adjacent renovated and altered Pier 57.

Overall, the proposed project would not result in any significant adverse impacts to historic and cultural resources. ✷

A. INTRODUCTION

This chapter considers the effects of the proposed project on urban design and visual resources. The proposed project would construct a new public access pier to the north of the existing Pier 54, at the foot of West 13th Street within Hudson River Park.

The *City Environmental Quality Review (CEQR) Technical Manual* defines urban design as the totality of components that may affect a pedestrian's experience of public space. These components include streets, buildings, visual resources, open spaces, natural resources, wind, and sunlight. An urban design assessment under CEQR must consider whether and how a project may change the experience of a pedestrian in a project area. The *CEQR Technical Manual* guidelines recommend the preparation of a preliminary assessment of urban design and visual resources, followed by a detailed analysis, if warranted based on the conclusions of the preliminary assessment. The analysis provided below addresses urban design characteristics and visual resources for existing conditions and the future without and with the proposed project (the No Action and With Action conditions, respectively).

PRINCIPAL CONCLUSIONS

Overall, this analysis concludes that the proposed project would not have any significant adverse effects related to urban design and visual resources.

B. METHODOLOGY

Based on the *CEQR Technical Manual*, a preliminary assessment of urban design and visual resources is appropriate when there is the potential for a pedestrian to observe, from the street level, a physical alteration beyond that allowed by existing zoning. The proposed project would result in a physical alteration observable by pedestrians that is not currently allowed under existing permits or approvals. Therefore, the proposed project meets the threshold for a preliminary assessment of potential impacts to urban design and visual resources.

As described above, urban design is the totality of components that may affect a pedestrian's experience of public space. This assessment considers the effects of the proposed project on the experience of a pedestrian in the study area. The assessment focuses on those project elements that have the potential to alter the built environment, or urban design, of the project area, which is collectively formed by the following components:

- Streets—the arrangement and orientation of streets define location, flow of activity, street views, and create blocks on which buildings and open spaces are arranged. Other elements including sidewalks, plantings, street lights, curb cuts, and street furniture also contribute to an area's streetscape.

- Buildings—a building's size, shape, setbacks, pedestrian and vehicular entrances, lot coverage and orientation to the street are important urban design components that define the appearance of the built environment.
- Visual Resources—visual resources include significant natural or built features, including important view corridors, public parks, landmark structures or districts, or otherwise distinct buildings.
- Open Space—open space includes public and private areas that do not include structures, including parks and other landscaped areas, cemeteries, and parking lots.
- Natural Features—natural features include vegetation, and geologic and aquatic features that are natural to the area.

According to the *CEQR Technical Manual*, the study area for urban design is the area where the project may influence land use patterns and the built environment, and is generally consistent with that used for the land use analysis. For visual resources, the view corridors within the study area from which such resources are publicly viewable should be identified. The land use study area may serve as the initial basis for analysis; however, in cases where significant visual resources exist, it may be appropriate to look beyond the land use study area to encompass views outside of this area, as is often the case with waterfront sites or sites within or near historic districts.

The project site is located on the Hudson River waterfront within Hudson River Park. Consistent with the *CEQR Technical Manual* guidelines and the fact that existing views of the project site are limited within the surrounding area due to the density of development, the study area for the urban design and visual resources analysis has been defined as a 400-foot radius around the project site (see **Figure E-1**). Views from the Hudson River itself are also considered.

C. EXISTING CONDITIONS

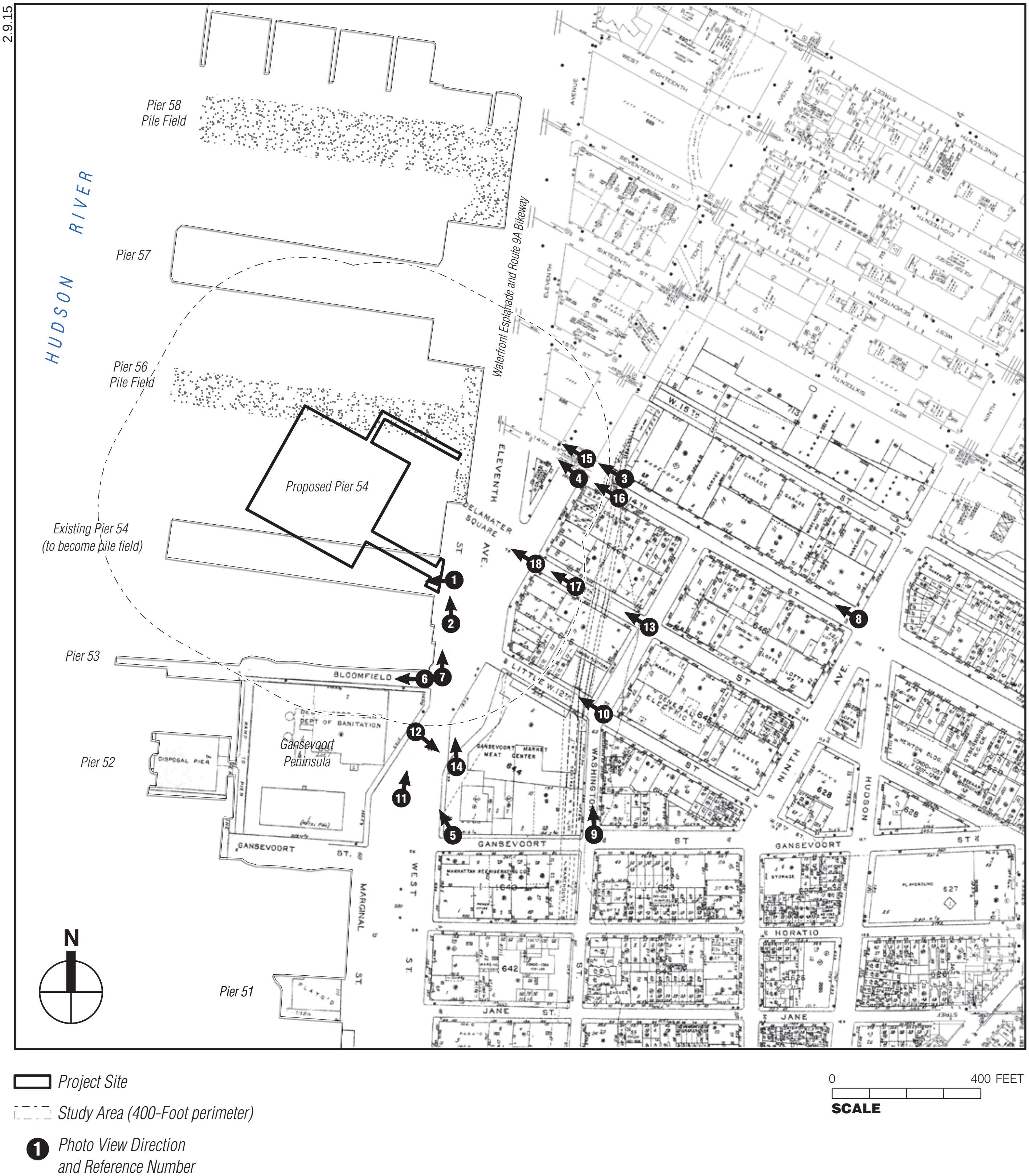
URBAN DESIGN

PROJECT SITE

Pier 54 consists of a visibly deteriorated concrete deck on timber pilings (see view 1 of **Figure E-2**). Concrete jersey barriers and chain link fencing are located on the vacant pier, and an iron arch is located at the eastern (landward) end. Masonry wall segments and a tall metal fence separate the pier from the adjacent Hudson River Park pedestrian esplanade and Route 9A bikeway that runs along the waterfront (see view 2 of **Figure E-2**). In this location, the park is narrow, consisting only of the paved esplanade, which is minimally landscaped with planter beds and ornamental lampposts.

STUDY AREA

The 400-foot study area is roughly bounded by Pier 57 and West 15th Street to the north, the High Line and Tenth Avenue to the east, and Little West 12th Street and the Gansevoort Peninsula to the south (see **Figure E-3** for an aerial photograph of the project site and study area). The Hudson River, other areas of Hudson River Park, and the High Line are defining elements of the area's urban design. West Street (Route 9A)—a wide, heavily trafficked highway—runs through the study area, creating a visual and physical boundary between the project site and the Meatpacking District neighborhood to the east. Running along the Hudson



Urban Design and Visual Resources

Figure E-1

View west at existing Pier 54 **1**

View north along Waterfront Esplanade/Route 9A Bikeway at existing Pier 54 **2**

Project Site

Study Area (400-Foot perimeter)

0 400 Feet

SCALE

Urban Design and Visual Resources
Aerial Photograph
Figure E-3

River waterfront, West Street is the main vehicular thoroughfare in the study area. It has four north-bound lanes and three south-bound lanes, and landscaped medians with trees and bushes separate the opposing lanes of traffic. The medians contain decorative mast-arm lampposts and provide safe refuge areas for pedestrians. Tenth Avenue, which intersects with West Street at West 13th Street also carries a heavy amount of vehicular traffic, as does West 14th Street. The topography of the study area is generally flat, with a slight rise from south to north and toward the east from the shoreline.

Hudson River Park occupies the area between West Street and the United States pierhead line in the Hudson River, and Pier 57 and the Gansevoort Peninsula are the most notable waterfront features in the study area. The majority of Hudson River Park is linear, expanded by numerous redeveloped piers, and upon completion will extend continuously from just north of Chambers Street to West 59th Street. Within the study area between Pier 57 and the Gansevoort Peninsula, Hudson River Park is narrow and includes a waterfront esplanade, a pedestrian path that extends along the entire length of the park. Adjacent to the park is the Route 9A bikeway, a bike path that extends along the entire length of the park. Decorative metal lampposts are used within the median separating West Street from the pedestrian and bike paths. Tall metal fencing and masonry walls run along the river's edge north and south of the current Pier 54, lessening the pedestrian's enjoyment of the waterfront views along this stretch of park (see view 2 of **Figure E-2**). Timber pilings, remnants of the former Pier 56, are located north of Pier 54.

Pier 57 is located at the northern edge of the study area. Described more fully in Attachment D, "Historic and Cultural Resources," Pier 57 consists of a two-story pier shed and a headhouse facing the Hudson River Park esplanade and West Street (see **Figure E-4**). The east elevation of the rectangular-plan, flat-roofed headhouse is clad in brick with stone trim. The first floor has regularly spaced door openings with rolling metal shutters. The north and south-facing elevations were historically attached to the headhouses of adjacent piers along the Hudson River, which have since been demolished. Therefore, these party wall elevations are windowless and presently finished in cement plaster/stucco. The pier shed is two stories tall above a basement and is 32 bays long on the north and south sides. Attached along the roof edge on the north and south façades are metal frameworks originally used for cargo handling. The roof is paved and not visible from the street level, and includes two central stair and elevator bulkheads and two smaller stair bulkheads. A walkway extends around most of the pier shed's perimeter, but does not continue along the north and south ends of the headhouse's wings, and thus does not connect to adjacent portions of Hudson River Park. The west end of the pier has rounded, streamlined corners clad in steel. Pier 57 is currently vacant and cuts park users off from the waterfront.

Along the Hudson River, the area south of Pier 54 is occupied by Piers 52 and 53 and the rest of the Gansevoort Peninsula, which extends from Little West 12th Street to Gansevoort Street. This approximately six-acre site is currently occupied by the City's municipal sanitation operation and the New York Fire Department Marine Company One (see **Figure E-5**). Department of Sanitation facilities on the peninsula include a free-standing three-story utilitarian brick building with stone trim, a metal shed to the south, and a pier extension with an elevated metal pier shed. Truck parking surrounds the brick building, and sanitation trucks are a defining visual feature of the Gansevoort Peninsula. Marine Company One is located on the north side of the peninsula and occupies a small, modern building with angled, metal-clad facades. Fireboat Three Forty Three and the smaller rescue craft Marine 1 are docked at the pier.

A small public park, which is part of Hudson River Park, is located to the northeast of the project site; 14th Street Park occupies the full block bounded by West 14th and 15th Streets and

Pier 57. View west from High Line at West 14th Street **3**

Pier 57. View west at West 14th Street and West Street **4**

Gansevoort Peninsula and Pier 57. View northwest on West Street **5**

Pier 53: Marine Company One. View west from Hudson River Park **6**

Tenth and Eleventh Avenues. Although it is separated from Hudson River Park by West Street, it serves to connect the waterfront to the surrounding commercial and residential uses. 14th Street Park is composed of a grass oval surrounded by trees and seating and bordered by a low metal fence. Entrances to the park are marked by decorative metal archways.

Within Hudson River Park as it runs through the study area, the experience of pedestrians and bicyclists is of traversing a narrow corridor between the heavy traffic on West Street and the fenced-off Hudson River. The Gansevoort Peninsula, the fence along the waterfront between the Gansevoort Peninsula and Pier 57, and Pier 57 create physical and visual barriers between the pedestrian and the river (see view 2 of **Figure E-2** and view 7 of **Figure E-6**). Views of the river and New Jersey are through fences.

Inland, the visual character of the study area is defined by the High Line and a mix of modern masonry, metal, and glass buildings and historic, low-rise, brick buildings formerly used for meatpacking and other similar uses that have been renovated as retail, restaurants, residences, hotels, art galleries, and studios (see view 8 of **Figure E-6** and view 9 of **Figure E-7**). Many of these older buildings are two and three stories in height, fully occupy their lots, are built to the lot line, and have entrances set above ground level, for ease of loading/unloading trucks. Many of the buildings have loading docks and roll-down metal shutters covering building entrances; some have broad metal canopies that gave cover to workers loading and unloading materials. This area has a lot of pedestrian traffic, and portions of the sidewalks are used as outdoor dining areas for restaurants.

The High Line is a new, elevated public park created on an elevated former rail line between Gansevoort Street and West 34th Street. Within the project study area, the High Line runs above the eastern edge of the block between Gansevoort and Little West 12th Streets, crosses Little West 12th Street, and then diagonally traverses the blocks between Little West 12th and West 14th Streets, from which point it runs north along the east side of Tenth Avenue through buildings. Where the High Line crosses over streets, its steel trestles have a decorative appearance (see view 10 of **Figure E-7**). As the High Line passes over blocks, it is supported on steel stanchions and has a more utilitarian appearance. The park is landscaped with grasses, shrubs, and trees along concrete pathways at an elevation of approximately 25 feet. Ground-level access points for the High Line within the study area are located at Washington and Gansevoort Streets (the southern terminus of the park and viaduct) and just west of Tenth Avenue at West 14th Street.

Three tall, modern buildings are located in the vicinity of the project site (see **Figure E-8**). Located across West Street from the project site, the 19-story (233-foot-tall) Standard Hotel occupies the block bounded by Washington Street, Tenth Avenue, West 13th Street, and Little West 12th Street. This wedge-shaped structure straddles the High Line on large concrete piers, and it is largely clad in glass. At ground level, the hotel includes a paved plaza with outdoor seating for restaurants. To the southeast of the project site, the Whitney Museum of American Art is currently constructing a new museum on the block bounded by Little West 12th Street, Washington Street, Gansevoort Street, and West Street. This building is massed with canted facades, terraces, cantilevers, and a height that steps up from 63 feet adjacent to the High Line to 175 feet facing West Street. When completed, it will have an outdoor "piazza" under a cantilever at the southeast corner of the site. Another new structure in the study area is the 15-story, 192-foot-tall High Line commercial building on West 14th Street near 10th Avenue. The High Line runs through the base of that building.

Hudson River Park. View north from south of Pier 54 **7**

View west on West 14th Street from Ninth Avenue **8**

Urban Design and Visual Resources

Study Area

Figure E-6

View north on Washington Street from Gansevoort Street **9**

View west on Little West 12th Street from Washington Street **10**

Standard Hotel: View north on West Street from Gansevoort Street **11**

Whitney Museum of American Art: View southeast from West Street **12**

Urban Design and Visual Resources

Study Area

Figure E-8

VISUAL RESOURCES

Visual resources are an area's unique or important public view corridors, vistas, or natural or built features. These can include historic structures, parks, natural features (such as rivers), or important views. Visual resources in the study area include the Hudson River vista, Pier 57, and the High Line.

Street-level pedestrian views of the Hudson River, the Hudson River vista, and of New Jersey in the far distance are limited to the area between Little West 12th Street and West 14th Street. Overall, within the view corridors along West 14th, West 13th, and Little West 12th Streets, views of the Hudson River vista widen as the pedestrian approaches West Street and the Hudson River waterfront. In these views, the wide and heavily trafficked West Street is in the foreground. From points farther east within the study area away from the waterfront, views of the Hudson River vista are narrower and framed by the High Line and buildings lining the streets. Several existing structures block views within the study area. In addition, trees located in the median of West Street obstruct views of the Hudson River vista along West 13th Street. Views of the river are also variable along the Hudson River Park esplanade. The Gansevoort Peninsula blocks and detracts from views of the waterfront (see view 5 of **Figure E-5**). Pier 57 also obstructs views but it is a visual resource itself, as described below. From Washington Street and points east, views of the Hudson River waterfront and vista are partially obscured and framed by the High Line (see view 8 of **Figure E-6,** view 10 of **Figure E-7, and view 13 of Figure E-9**). From within Hudson River Park and along West Street, views are open but the tall metal fence and some masonry wall remnants of former pier structures along the waterfront detract from views. Further, aside from the remaining area of Pier 54 that is currently safe for public access, there are limited locations within the study area where pedestrians can get out over the water, like there are farther north and south within the park. The wide, heavily trafficked West Street also detracts from the views of the waterfront (see view 14 of **Figure E-9** and view 15 of **Figure E-10**). Within the study area, the High Line provides the best views of the river and vista, as it provides views from an elevated perspective that are not typically available to pedestrians (see view 16 of **Figure E-10**). There are multiple locations along the southern end of the High Line that provide expansive views.

Pier 57 is considered a visual resource. The long metal-clad sides of the pier shed can be viewed from West Street and Hudson River Park. Views of Pier 57 are variable along the Hudson River Park esplanade, as well as from West Street. The visibility of the pier from south of the study area is limited due to distance and intervening buildings, which include the Department of Sanitation building on the Gansevoort Peninsula. Pier 57 is best viewed in the vicinity of West 14th Street, and it continues to be visible from farther away east of the High Line, although the High Line frames and obstructs those views (see view 4 of **Figure E-4** and view 8 of **Figure E-6**). From the High Line, there are multiple locations from which Pier 57 is visible. The area around West 14th Street provides unobstructed views of the pier (see view 16 of **Figure E-10**). Pier 57 is also visible from watercraft in the Hudson River and from the north along the Hudson River Park esplanade and on West Street.

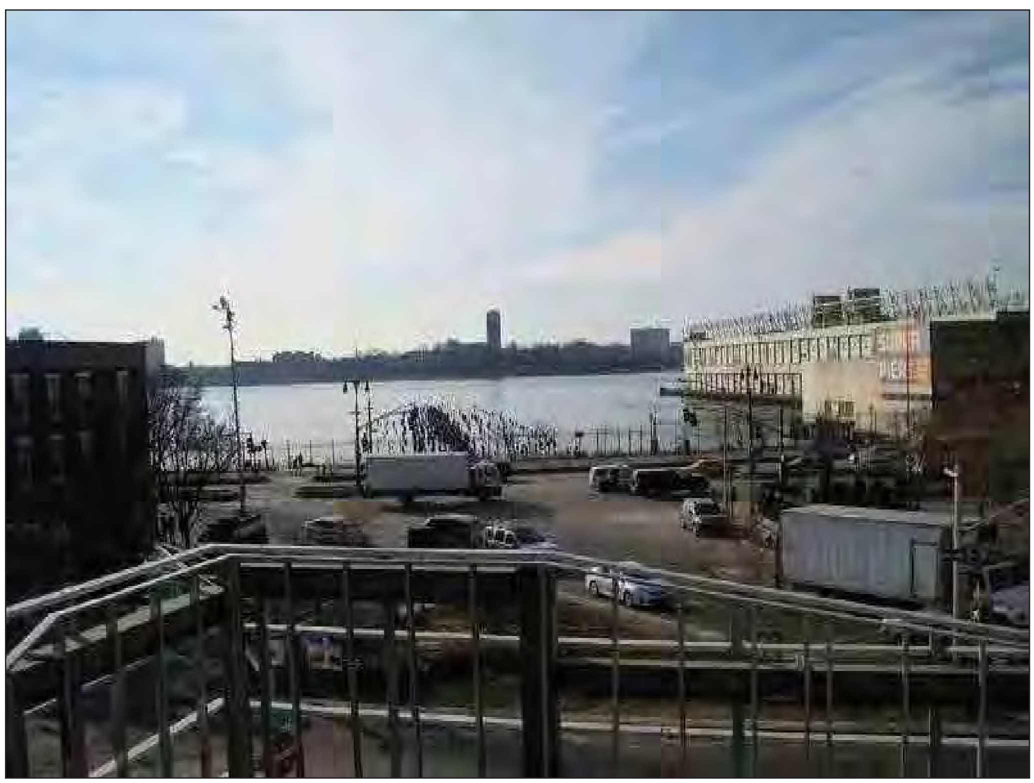
Views throughout the study area also include the High Line: the ornamented metal viaduct carrying the former rail line, the extensive landscaping that is now planted in the elevated open space, and the people utilizing this resource. As mentioned above, views from the High Line itself are extensive in all directions.

There are some views of the project site within Hudson River Park, in the immediate vicinity on West Street, in the West 13th Street view corridor, and from the High Line (see **Figures E-9,**

View west on West 13th Street from Washington Street **13**

View northwest on West Street between Little West 12th Street and Gansevoort Street **14**

View west at West 14th Street and West Street **15**



View west from High Line in the vicintity of West 14th Street **16**

E-10, and E-11); these views range from largely unobstructed to largely obstructed. The project site is located directly within the West 13th Street view corridor. From east of the High Line, the viaduct frames and restricts the views of the project site along the street (see view 13 of **Figure E-9**). On the west side of the High Line, West 13th Street provides partial views of the project site and the Hudson River vista. In those views, however, West Street is in the foreground, and three tall trees in the median are located in the center of the view corridor (see **Figure E-11**). The project site is also visible from watercraft in the Hudson River.

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

PROJECT SITE

In the future without the proposed project, Pier 54 would be reconstructed as a public open space consistent with its previous park use. A new flat deck would be installed on new structural piles. The existing piles would largely be retained but would not be visible beneath the rebuilt pier. The reconstruction of Pier 54 would open up the section of Hudson River Park that runs through the study area, enhancing waterfront access and the experience of park users. Further, the rebuilt Pier 54 would allow pedestrians out over the river and provide vantage points, similar to those that previously existed on the pier, from which to observe the Hudson River and its vista and the Manhattan skyline.

STUDY AREA

In the future without the proposed actions, the Hudson River Park Trust will construct the Pier 54 Connector Project. This project would enhance Hudson River Park between West 14th Street and the Gansevoort Peninsula through an improved and widened pedestrian walkway built on a new overwater pedestrian platform, improvements to the Route 9A bikeway alignment, a new lay-by area for a future public bus stop, and landscaping. As part of that project, the existing fences and masonry walls along the park edge would be removed and replaced with a more aesthetic and appropriately scaled railing. The Pier 54 iron arch will be retained in its existing location. With the completion of the reconstruction of Pier 54, the renovation of Pier 57 (described below), and construction of the Pier 54 Connector Project, the section of Hudson River Park within the study area would be greatly enhanced; the pedestrian walkway would be widened, views of the river would be opened up, waterfront access would be increased, and landscaping would be added.

In addition, there are four projects under construction or planned in and immediately around the 400-foot study area. These projects include: the renovation of Pier 57; the new approximately 240,000-square-foot facility for the Whitney Museum of American Art described above; a commercial building at the northeast corner of Tenth Avenue and West 13th Street adjacent to the High Line; a 10-story commercial building at the northwest corner of Washington Street and West 13th Street adjacent to the High Line; and a retail building adjacent to the High Line at the northeast corner of Tenth Avenue and West 14th Street. The four projects will increase the density of the study area, add new active ground floors to the study area, and further change the character of the study area’s western edge where there are already multiple modern buildings and additions to older, low-rise buildings.

There are plans to rehabilitate Pier 57 and redevelop it with new uses and publicly accessible open space. Under current plans, the pier’s headhouse and water-side (foot house) facades would be restored. The rooftop of the pier shed would be redeveloped as a new publicly accessible

View west on West 13th Street **17**

View west on West 13th Street at Tenth Avenue **18** open space that would consist of open areas and a central pavilion. In addition, the existing perimeter walkway extending around most of the pier would be repaired and extended to connect with the existing Hudson River Park waterfront esplanade to the east of the pier. New public walkways would be constructed parallel to the existing bulkhead to widen the public park space. This project, in conjunction with the renovation of Pier 54, would enhance the pedestrian experience along the esplanade, as well as from other locations with views of Pier 57, by increasing pedestrian access to the waterfront and improving Hudson River Park within the study area. Pier 57 would also provide new vantage points for observing the Hudson River and Manhattan skyline.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

URBAN DESIGN

The *CEQR Technical Manual* guidelines state that if the preliminary assessment shows that changes to the pedestrian environment are sufficiently significant to require greater explanation and further study, then a detailed analysis is appropriate. Examples include projects that would potentially obstruct unique view corridors, compete with icons in the skyline, or make substantial alterations to the streetscape of a neighborhood by noticeably changing the scale of buildings. Detailed analyses also are generally appropriate for area-wide rezonings that include an increase in permitted floor area or changes in height and setback requirements, general large-scale developments, or projects that would result in substantial changes to the built environment of a historic district or components of a historic building that contribute to the resource's historic significance. As described below, the proposed project would not meet any of these thresholds requiring a detailed analysis. The proposed project would be a new unique feature of the area's urban design, but it would not noticeably change the scale of buildings; would not involve an area-wide rezoning that includes an increase in permitted floor area or changes in height or setback requirements; would not involve a general large-scale development; and would not result in substantial changes to the built environment of a historic district, nor would it obstruct unique view corridors that are considered defining features of the neighborhood or compete with icons in the skyline.

The proposed project would construct a new public access pier with a different overwater footprint than the existing Pier 54. The new Pier 54 would contain approximately 117,000 gross square feet of open space (including the access ramps) and would be generally located between the current Pier 54 footprint and the former Pier 56 footprint to the north within Hudson River Park at approximately West 13th Street. The new pier would have two access ramps from the Hudson River Park waterfront esplanade that will be expanded in the future without the proposed project as part of the Pier 54 Connector project. A pile field would also be created at the existing Pier 54 footprint. (**Figure A-3** is a site plan of the proposed project.)

Unlike a typical pier with a rectangular footprint, the new Pier 54 would have a square footprint. Further, Pier 54 would have a topographically contoured deck with elevated corners; it would be engineered as a rolling landscape occupied by lawns, planted areas of shrubs and trees, and paved walking and seating areas. (See **Figure E-12** for an illustrative aerial view of the proposed project. **Figures A-4** and **A-5** show elevations of the proposed project.) The elevations of the proposed pier platform would range from 8.7 feet Manhattan Borough Datum (MBD) on the amphitheater floor along the western edge of the pier to approximately 62.0 feet MBD at the southwest corner, which would be the highest point on the new pier. The vast majority of the

Urban Design and Visual Resources
Proposed Project: Illustrative Aerial View
Figure E-12

proposed pier would be at elevation 15 feet MBD or higher. The pier would be supported by piles that would rise from the Hudson River and widen underneath the pier platform to create the appearance of "pots" supporting the park landscape. This pile design would allow views of the river under the pier and through the piles. Under-pier lighting would be designed to highlight the innovative substructure design.

The new pier would be landscaped with a combination of grass, ornamental plantings, railings, decorative and safety lighting, pavement, and other elements of park design. Lawns would provide places for active and passive recreation. The pier's topography would provide multiple elevated vantage points over the water from which park uses could take in views of the Hudson River and the Hudson River vista, the historic Pier 57, Hudson River Park, and the Manhattan skyline. **Figures A-6** through **A-10** show illustrative renderings of the proposed project. As described in Attachment A, "Project Description and Environmental Analysis," the new pier would have three unenclosed performance areas that would be integrated into the topography of the proposed pier.

The proposed project would enhance the existing streetscape and pedestrian environment of Hudson River Park and West Street, complementing the park improvements undertaken in the No Action condition by the Pier 57 renovation and the Pier 54 Connector Project. While the reconstruction of Pier 54 in the No Action condition would enhance Hudson River Park as described above, the proposed project would create a visually unique waterfront structure with expanded park areas, elevated vantage points for expansive views, and notable greenery in the form of lawns, trees, and other plantings.

The *CEQR Technical Manual* recommends an analysis of pedestrian wind conditions for projects that result in the construction of large buildings at locations that experience high wind conditions (such as along the waterfront, or other location where winds from the waterfront are not attenuated by buildings or natural features), which may result in an exacerbation of wind conditions due to "channelization" or "downwash" effects that may affect pedestrian safety. The proposed project would not involve the construction of large buildings. In any case, given the location, pier elevations and contours of the proposed project, and the prevailing winds in the vicinity, the proposed project is not expected to result in pedestrian wind conditions notably different than those encountered in other sections of the park. In general, pedestrian winds on the proposed pier would be similar to those on other nearby piers and, given the pier design, may be somewhat reduced from the open plan of the previous Pier 54. In particular, planting on the corners and topography would buffer winter winds from the northeast and northwest.

In summary, the proposed project does not meet any of the thresholds listed above that would merit further analysis of urban design and would not result in significant adverse impacts to urban design.

VISUAL RESOURCES

According to the guidance of the *CEQR Technical Manual*, additional visual resources analysis is required if: a project would partially or totally block a view corridor or a natural or built visual resource, and that resource is rare in the area or considered a defining feature of the neighborhood; or, a project would change urban design features so that the context of a natural or built visual resource is altered (for example, if a project alters the street grid so that the approach to the resource changes; if a project changes the scale of surrounding buildings so that the context changes; or if a project removes lawns or other open areas that serve as a setting for the resource).

Figures E-13 through E-18 provide illustrative views of the proposed project from West Street, West 13th Street, the High Line, and from out in the Hudson River. Overall, views of Pier 54 would vary within the study area, because its footprint, pile design, and rolling topography would allow multiple, differing views over and under the pier and through the piles.

The proposed project would have a positive effect on visual resources, because it would provide new elevated vantage points for pedestrians to view the adjacent Pier 57, the Hudson River and Hudson River vista, the High Line, and the Manhattan skyline. Pier users would be able to get close to the water surface and ascend to the higher points of the pier where they would have unobstructed panoramic views of the nearby Pier 57, New Jersey across the river, inland New York City, and potentially of the New York Harbor from the western edge of the pier.

The proposed project would not eliminate any view corridors but would partially obstruct the view along West 13th Street. It would not change any urban design features such that the context of natural or built visual resources is substantially altered. While the new pier would be located within the West 13th Street view corridor, that view corridor does not provide unique views of the Hudson River vista in the study area and is not a defining feature of the neighborhood. West 14th Street and Little West 12th Street provide better views of the Hudson River vista. With the proposed project, the Hudson River vista would remain visible within the West 13th Street corridor above the pier and views of the sky would be unobstructed, because the pier has been designed to have a low elevation within the view corridor. The topography of the pier dips down towards street level within the view corridor, thereby allowing views over the pier to New Jersey (see **Figures E-13** and **E-14**). In any case, as described above there are existing tall trees located in the West Street median that are at the center of the West 13th Street view corridor. As described in Attachment B, “Land Use, Zoning and Public Policy, the new pier would not be located in the West 14th Street and Little West 12th Street visual corridors as defined by zoning, and those streets would continue to function as visual corridors for zoning purposes. West 14th and Little West 12th Streets would continue to provide views of the Hudson River that are not obstructed by trees. Although Pier 54 would not be located in the Little West 12th Street visual corridor as defined by zoning, the pier’s southernmost edge would be minimally visible along that street from Washington Street and points west due to the low-rise nature of the block between Washington Street and Tenth Avenue and proximity to the waterfront. Views, however, would not be obstructed in the Little West 12th Street view corridor.

While the new Pier 54 would be located just to the south of Pier 57 and would obstruct some views of the historic pier from the Hudson River Park esplanade and the Route 9A bikeway from south of the project site, these obstructed views would not be expected to result in a significant adverse effect. South of West 13th Street, depending on the pedestrian’s location, the existing Pier 54 arch would be seen in the foreground of Pier 57, obstructing views. The new pier footprint would be separated from the westernmost edge of the future Pier 54 Connector project overwater pedestrian platform by approximately 135 feet, which would preserve northward views of Pier 57 along Hudson River Park and West Street. The topography of the pier would also allow views over the pier to Pier 57. From farther south, the Department of Sanitation facility on the Gansevoort Peninsula currently blocks views of Pier 57. Northward views of Pier 57 would continue to be available from its immediate vicinity and from south of the new Pier 54. In addition, Pier 54 would provide new, publicly accessible views of the historic Pier 57.

In the future, it is expected that the Gansevoort Peninsula will eventually be redeveloped as open space as part of Hudson River Park once the City municipal sanitation facilities can be relocated. This is expected to occur after the proposed project’s 2019 analysis year. Nonetheless, in order

Urban Design and Visual Resources

Proposed Project: Illustrative View on West 13th Street from Washington Street

Figure E-13

Urban Design and Visual Resources

Proposed Project: Illustrative View on West 13th Street near Tenth Avenue

Figure E-14

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Urban Design and Visual Resources

Proposed Project - Illustrative View at West 14th Street and West Street

Figure E-15

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Urban Design and Visual Resources

Proposed Project - Illustrative View from the High Line above West 14th Street

Figure E-16

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Urban Design and Visual Resources
Proposed Project - Illustrative View from Hudson River

Figure E-17

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Urban Design and Visual Resources

Proposed Project - Illustrative View North from Route 9A and Horatio Street

Figure E-18

to consider the effects of the proposed project on views toward Pier 57 from the south within Hudson River Park, **Figure E-18** provides an illustrative view outlining the location of the proposed project relative to the Gansevoort Peninsula and Pier 57. This illustrative rendering shows that Pier 57 would be visible beyond Pier 54.

The new pier would be clearly visible from West Street and Hudson River Park in the immediate vicinity, where it would be seen as a unique, landscaped element of the waterfront. Similarly, the new pier would clearly be visible from watercraft on the Hudson River; passengers would see the new pier in the foreground of the Manhattan skyline as one of many pier structures along the waterfront. From inland, Pier 54 would be visible in the West 13th Street corridor as described above, but there would be views of the Hudson River vista over the pier. Pier 54 would not be visible in the West 14th Street view corridor and only minimally visible from some locations in the Little West 12th Street view corridor. From the High Line, the new pier would be visible from some locations, such as from West 14th Street and the area south of Little West 12th Street, but it would be seen in context with the Standard Hotel, the new facility for the Whitney Museum of American Art, and other recently-constructed buildings lining the High Line and with the adjacent renovated and altered Pier 57. From the elevation of the High Line, Pier 54 would be part of the Hudson River vista, seen with views of the water and of New Jersey (see **Figure E-16**). Therefore, the proposed project does not require further analysis of visual resources, and would not result in significant adverse impacts to visual resources. ✷

A. INTRODUCTION

This chapter examines the proposed project's potential impacts on terrestrial and aquatic natural resources[1] and floodplains near the project site (see Attachment A, "Project Description and Environmental Analysis"). This chapter will cover:

- The regulatory programs that protect floodplains, wildlife, threatened or endangered species, aquatic resources, or other natural resources within the project site;
- The current condition of the floodplain and natural resources within the study area, including water and sediment quality, and biological resources, including aquatic biota, terrestrial biota, and threatened or endangered species and species of special concern;
- The floodplain, water quality, and natural resources conditions in the future without the proposed project (the No Action condition); and
- The potential impacts of the proposed project on the floodplain, water quality, and natural resources (the With Action condition).

The proposed project would result in the redevelopment of Pier 54—a largely vacant pier within the Hudson River Park that has hosted a wide range of programs under the Hudson River Park Trust's (HRPT) jurisdiction. Approximately ¼ of the pier's original footprint remains open for public use. The remaining portion of the pier was closed in 2013 because of deteriorated pile and platform conditions. The project calls for a limited number of activities that have the potential to affect the aquatic environment, including creation of new over-water coverage for the new pier platform, the two access ramps, the southern balcony, and the temporary amphitheater support vessel; installation of piles in the bed of the Hudson River to support the pier, and fendering system, and discharge of stormwater runoff. The proposed project would result in an increase in overwater coverage of less than one acre and would not require any dredging.

As discussed in Attachment A, "Project Description and Environmental Analysis," Pier 54 is part of the Hudson River Park, which was the subject of an environmental review in the late 1990s (*Hudson River Park Final Environmental Impact Statement (FEIS)*, May 1998). Permits and subsequent renewals were issued to HRPT (U.S. Army Corps of Engineers [USACE], Permit 1998-00290) and New York State Department of Environmental Conservation (NYSDEC, Permit 2-6299-00004/00001)) that authored the renovation and reconstruction of Pier 54. HRPT received construction authorizations for reconstruction of Pier 54 within the existing footprint in 2005. The existing Pier 54 has 3,471 piles. Reconstruction would include

[1] The *City Environmental Quality Manual* (*CEQR) Technical Manual* defines natural resources as "(1) the City's biodiversity (plants, wildlife and other organisms); (2) any aquatic or terrestrial areas capable of providing suitable habitat to sustain the life processes of plants, wildlife, and other organisms; and (3) any areas capable of functioning in support of the ecological systems that maintain the City's environmental stability."

removal of pier platform and pile caps, driving of 220 new 24-inch square concrete piles spaced with the existing timber piles that will remain to maintain the existing 5 foot by 10-foot grid (i.e., existing timber piles located where a new concrete pile is to be driven would be extracted from the river bottom), installation of 361 new fender piles spaced 8 feet apart along the pier perimeter, and installation of new pile caps and concrete pier platform within the existing footprint. Approximately 240 existing timber piles would be extracted from the river bottom completely as necessary to prevent interference with driving of the new piles and to comply with Special Condition E of the USACE permit for the park that limits changes in pile density beneath repaired or reconstructed piers to up to 10 percent of the number of existing piles beneath the pier to be repaired or reconstructed. In compliance with Special Condition F of the USACE permit for the park, pile extraction would be done in a manner that does not result in substantial sediment resuspension. The remaining timber piles would be left in place under the reconstructed Pier 54 platform but would not provide structural support for the reconstructed pier.

The proposed project would instead reconstruct Pier 54 at a new location to the north within a new footprint. This attachment assesses the incremental impacts to natural resources from the proposed project when compared with conditions in the future without the proposed project (the No Action/No Build condition), the reconstruction of Pier 54 within the existing footprint.

Because the proposed project and the Pier 57 in the Hudson River Park Project may result in concurrent pile driving during no more than one May 1 through October 31 pile driving period, the cumulative effects of pile driving for both projects have been considered in this chapter.

PRINCIPAL CONCLUSIONS

The construction activities associated with the proposed project would not cause any significant adverse environmental impacts on terrestrial or aquatic resources. Increases in suspended sediment resulting from construction activities would be temporary and localized and would dissipate quickly. Compared to the No Action condition, the proposed project would result in substantially less shading of aquatic habitat (decrease of about 50 percent) than the No Action pier.

Subadult and adult shortnose sturgeon and Atlantic sturgeon (federally-listed endangered species) may be using the Lower Hudson River in the vicinity of the proposed project as a migration corridor to or from foraging, overwintering, and/or spawning grounds. In this portion of the Hudson River, they would be more likely to be present in the deeper water habitat of the navigation channel, and would only occur in the interpier area where proposed project would be located as occasional transient individuals. Because the proposed project would only require short periods of driving with an impact hammer to seat the pile into bedrock (i.e., about 90 minutes per day), and would employ measures to minimize exposure of sturgeon potentially to injurious or disturbing levels of underwater noise, any underwater noise levels exceeding those associated with injury would not affect the deeper water habitats of the Hudson River, nor will underwater noise levels obstruct movement of migrating sturgeon past the project. Therefore, the proposed project may affect, but is unlikely to adversely affect shortnose and Atlantic sturgeon, and will not result in any incidental take for Atlantic or shortnose sturgeon under the Endangered Species Act (ESA) of 1973 and Article 11 of the New York State Environmental Conservation Law.

The prohibition of pile driving from November through April to protect overwintering striped bass would minimize potential impacts to striped bass and other fish overwintering within the vicinity of Pier 54. Seals and the four species of threatened or endangered sea turtles that may be present in the Harbor Estuary would only occur in the vicinity of Pier 54 as occasional transient individuals and would likewise not be significantly impacted by construction activities.

Operation of the proposed project, including the discharge of stormwater from the pier to the Hudson River, nighttime lighting of the pier, and establishment of the Pier 54 pile field, is consistent with the use of this portion of the park as specified in the Hudson River Park Estuarine Sanctuary Management Plan (Sanctuary Plan), and would not result in significant adverse impacts to floodplains, water quality, aquatic habitat, fish, or benthic macroinvertebrates, essential fish habitat (EFH) or a Significant Coastal Fish and Wildlife Habitat. Operation of the proposed project would not result in significant adverse impacts to terrestrial resources, and would benefit insect pollinators such as butterflies and bees, and migratory and resident birds through the green landscaping of the pier with native plants tolerant of salinity from salt spray, winds, solar exposure and human use.

No NYSDEC or USACE wetlands occur onsite and therefore no disturbance to such resources would result from the proposed project.

B. METHODOLOGY

OVERVIEW

Because the proposed project would not have the potential to affect terrestrial resources or the floodplain beyond the project site, the study area for these resources is limited to the boundaries of the reconstructed Pier 54 within the existing footprint (the No Action condition), and the reconstruction of Pier 54 as described for the proposed project including the landings of the access ramps along the shoreline of Hudson River Park (the With Action condition). An exception was made for the identification of threatened or endangered terrestrial and aquatic species, which were evaluated for a distance of at least a half mile from the project site. The study area for water quality and aquatic resources includes the overall aquatic resources within the Lower Hudson River and the Hudson River waterfront portion of the project site. It is anticipated that construction would begin in 2015, with the new Pier 54 complete and operational in 2019.

EXISTING CONDITIONS

Existing conditions for floodplain, water quality, and natural resources within the study area were summarized from:

- Existing information identified in literature and obtained from governmental and nongovernmental agencies, such as the New York City Department of Environmental Protection (NYCDEP) Harbor Water Quality Survey (NYCDEP 2012, 2013, 2014); NYCDEP City-Wide Long Term Combined Sewer Overflow (CSO) Control Planning Project reports; U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory maps and federally listed threatened or endangered species for New York County, New York; studies conducted within the Hudson River Park; New York/New Jersey Harbor Estuary Program; U.S. Environmental Protection Agency (USEPA) Regional Environmental Monitoring and Assessment Program (R-EMAP); Federal Emergency Management Agency (FEMA) flood insurance rate maps (FIRMs); and USACE studies conducted as part of the New York and New Jersey Harbor Navigation Project.

- Responses to requests for information on rare, threatened, or endangered species in the vicinity of the project site. These requests were submitted to the National Marine Fisheries Service (NMFS) and the NYSDEC Natural Heritage Program (NHP). In addition to the state program, the USFWS maintains information for federally listed threatened or endangered freshwater and terrestrial plants and animals, and the NMFS does the same for federally listed threatened or endangered marine organisms.

THE FUTURE WITHOUT THE PROPOSED PROJECT

FLOODPLAINS AND TERRESTRIAL RESOURCES

In the No Action condition, the existing Pier 54 would be reconstructed with new and repaired piles and a new platform in the footprint of the existing pier. The elevation of the reconstructed pier platform would be below the preliminary FIRM 100-year flood elevation.

WATER QUALITY AND AQUATIC RESOURCES

In the No Action condition, the assessment of water quality and aquatic resources considers:

- The effect of the reconstructed Pier 54 within the existing footprint, including the resulting approximately 3,231 piles that would be within the pier footprint comprising existing timber piles that would no longer provide structural support, the extraction of 240 timber piles in order to install 220 concrete piles to support the new pier platform, and the resulting spacing of existing timber and new concrete pile on 5 foot by 10 foot grids; and the 361 fender piles spaced 8 feet apart.
- The location of the redeveloped Pier 54 under the proposed project would remain as interpier open water habitat; and
- Ongoing and proposed projects in the vicinity of the project site, including:
  - The Pier 57 redevelopment project and platform improvements between Piers 54 and 57;
  - Water quality and sediment quality improvements expected to occur as a result of regional and local programs; and
  - Habitat enhancement or restoration activities associated with the New York/New Jersey Harbor Estuary Program (HEP) or Hudson-Raritan Estuary Ecosystem Restoration Project (HRE).

THE FUTURE WITH THE PROPOSED PROJECT

In the With Action condition, the assessment of potential impacts on the floodplain, wetlands, aquatic, and terrestrial resources from the proposed project considers the following:

- The existing water quality and natural resources of the Hudson River in the vicinity of the project site and in the No Action condition.
- The potential for construction of in-water components, such as work on the pier's support structures, and potential concurrent pile driving at Pier 57 comprising 250 18-inch diameter timber fender piles along the edge of the pier and 40 24 by 24 inch precast concrete piles for the bulkhead and perimeter walkway extensions, to result in temporary impacts to water quality and aquatic organisms. These potential impacts may include:
  - Temporary increases in suspended sediment and release of contaminants during sediment disturbance; and

- Temporary loss of fish breeding, nursery, or foraging habitat, or EFH identified by the NMFS, from temporary water quality changes.

- The potential for operation of the proposed project, such as discharge of stormwater from the pier to adversely affect water quality of the Hudson River, when compared with the reconstructed Pier 54 in the With Action condition.
- The potential for overwater coverage associated with the proposed project to result in significant adverse impacts to aquatic habitat due to shading, and other operational effects such as nighttime lighting when compared with the reconstructed Pier 54 in the No Action condition.
- Projected sea-level rise due to climate change.
- Future severe storm events.

C. REGULATORY CONTEXT

In-water activities associated with the proposed project must comply with federal and state legislation and regulatory programs that pertain to activities in coastal areas, surface waters, floodplains, wetlands, and the protection of species of special concern. The proposed project would abide by permit conditions established for the development of the Hudson River Park authorized under Section 404 and Section 10 of the Rivers and Harbors Act in USACE Permit Number 1998-00290 and NYSDEC Permit Number 2-6299-00004/0000, and subsequent renewals, but will require modification to these permits due to the proposed relocation and change in design of the proposed Pier 54, and establishment of the Pier 54 pile field. Applicable federal and state regulations are discussed below.

FEDERAL REGULATIONS

CLEAN WATER ACT (33 USC §§ 1251 TO 1387)

The objective of the Clean Water Act, also known as the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. It regulates point sources of water pollution, such as discharges of municipal sewage, industrial wastewater, and stormwater; the discharge of dredged or fill material into navigable waters and other waters; and non-point source pollution, such as runoff from streets, agricultural fields, construction sites, and mining that enter water bodies from sources other than the end of a pipe.

Section 404 of the Act requires authorization from the Secretary of the Army, acting through USACE, for the permanent or temporary discharge of dredged or fill material into navigable waters and other waters of the United States. Waters of the United States is defined in 33 CFR 328.3 and includes wetlands, mudflats, and sandflats that meet the specified requirements, in addition to streams and rivers that meet the specified requirements. Activities authorized under Section 404 must comply with Section 401 of the Act.

Under Section 401 of the Act, any applicant for a federal permit or license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge would occur or from an interstate water pollution control agency, that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316 (b) of the Clean Water Act. Applicants for discharges to navigable waters in New York must obtain a Water Quality Certification from NYSDEC.

RIVERS AND HARBORS ACT OF 1899

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Secretary of the Army, acting through USACE, for the construction of any structure in or over any navigable water of the United States, the excavation from or deposition of material in these waters, or any obstruction or alteration in navigable waters of the United States. The purpose of this Act is to protect navigation and navigable channels. Any structures placed in or over navigable waters, such as pilings, piers, or bridge abutments up to the mean high water line, are regulated pursuant to this Act.

MAGNUSON-STEVENS ACT (16 USC §§ 1801 TO 1883)

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for the NMFS and the Regional Fishery Management Councils (in this case, the Mid-Atlantic Fishery Management Council) to comment on activities proposed by federal agencies (issuing permits or funding projects) that may adversely impact areas designated as EFH. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (16 USC §1802(10)).

Adverse impacts on EFH, as defined in 50 CFR 600.910(A), include any impact that reduces the quality and/or quantity of EFH. Adverse impacts may include:

- Direct impacts, such as physical disruption or the release of contaminants;
- Indirect impacts, such as the loss of prey or reduction in the fecundity (number of offspring produced) of a managed species; and
- Site-specific or habitat-wide impacts that may include individual, cumulative, or synergetic consequences of a federal action.

ENDANGERED SPECIES ACT OF 1973 (16 USC §§ 1531 TO 1544)

The Endangered Species Act of 1973 recognizes that endangered species of wildlife and plants are of aesthetic, ecological, educational, al, recreational, and scientific value to the nation and its people. The Act prohibits the importation, exportation, taking, possession, and other activities involving illegally taken species covered under the Act, and interstate or foreign commercial activities. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival.

FISH AND WILDLIFE COORDINATION ACT (PL 85-624; 16 USC 661-667D)

The Fish and Wildlife Coordination Act entrusts the Secretary of the Interior with providing assistance to, and cooperation with, federal, state, and public or private agencies and organizations to ensure that wildlife conservation receives equal consideration and coordination with other water-resource development programs. These programs can include the control (such as a diversion), modification (such as channel deepening), or impoundment (dam) of a body of water.

NEW YORK STATE REGULATIONS

PROTECTION OF WATERS, ARTICLE 15, TITLE 5, ECL, IMPLEMENTING REGULATIONS 6 NEW YORK CODE OF RULES AND REGULATIONS (NYCRR) PART 608

NYSDEC is responsible for administering the Protection of Waters Act and regulations to govern activities on surface waters (rivers, streams, lakes, and ponds). The Protection of Waters Permit Program regulates five different categories of activities: disturbance of stream beds or banks of a protected stream or other watercourse; construction, reconstruction, or repair of dams and other impoundment structures; construction, reconstruction, or expansion of docking and mooring facilities; excavation or placement of fill in navigable waters and their adjacent and contiguous wetlands; and Water Quality Certification for placing fill or other activities that result in a discharge to waters of the United States in accordance with Section 401 of the Clean Water Act.

ENDANGERED AND THREATENED SPECIES OF FISH AND WILDLIFE; SPECIES OF SPECIAL CONCERN (ECL, SECTIONS 11-0535[1]-[2], 11-0536[2], [4], IMPLEMENTING REGULATIONS 6 NYCRR PART 182)

The Endangered and Threatened Species of Fish and Wildlife, Species of Special Concern Regulations prohibit the taking, import, transport, possession, or selling of any endangered or threatened species of fish or wildlife, or any hide, or other part of these species as listed in 6 NYCRR §182.6.

HUDSON RIVER PARK ESTUARINE SANCTUARY MANAGEMENT PLAN

The Sanctuary Management Plan, developed by HRPT, identifies management policies for the Hudson River Park Estuarine Sanctuary (Sanctuary) with respect to resource protection and preservation, public access and recreation, education, and research activities. The purpose of the Sanctuary Plan is to provide guidance on balancing the needs of these various park uses and identify procedures for monitoring and enforcing park policies, laws, and regulations to manage and protect the Hudson River and the Sanctuary.

The preservation objectives focus on controlling the solid waste and water pollution that may result from waterfront activities while improving water quality, aquatics, wildlife habitat, and promoting native species and sustainable design. The Estuarine Sanctuary Management Plan goals include improving waterfront access, enhancing in-water safety, and encouraging the use of the waterfront through special events and programs. Educational objectives include expanding learning opportunities within the Sanctuary through special programs and facilities, and developing partnerships with local and regional educational organizations. Research goals focus on analyzing the river habitats and their relationships with biotic and abiotic sources, assessing impacts of development activities, and developing methods for habitat improvement.

D. EXISTING CONDITIONS

Per the *CEQR Technical Manual*, a natural resources assessment considers the plant, wildlife, and other species in the context of the surrounding environment, habitat, or ecosystem and examines a project's potential to impact those resources. Groundwater, soils, and geologic features; natural and human-created habitats; and any areas used by wildlife may be considered in a natural resources analysis. Stormwater runoff may also be considered in a natural resources assessment and evaluated in the context of its impact on local ecosystem functions and on the quality of adjacent waterbodies.

In accordance with the *CEQR Technical Manual*, this section describes existing natural resource conditions within the terrestrial and water quality and aquatic resources study areas.

FLOODPLAINS AND WETLANDS

Figure F-1 presents the 100-year (area with a 1 percent probability of flooding each year) floodplain boundary (Zones AE and VE) for the Pier 54 study area according to the FEMA preliminary FIRM for New York City released in December 2013. The Base Flood Elevation (the 100-year flood elevation - Zone AE) at the existing Pier 54 is at elevation +13 feet North American Vertical Datum of 1988 (NAVD88), which is above the +7.65 foot NAVD88 elevation of the existing platform of Pier 54. The interpier area between the existing Pier 54 and the Pier 56 pile field has a Base Flood Elevation of +16 NAVD88 (100-year flood elevation—Zone VE: an area of high flood risk subject to inundation by the 1 percent annual-chance flood event with additional hazards due to storm-induced velocity wave action (a 3-foot or higher breaking wave).

As discussed in Attachment D, “Historic and Cultural Resources,” the Hudson River bulkhead between Battery Place and West 59th Street has been determined eligible for listing on the State/National Registers of Historic Places. The shoreline in the vicinity of the project site is engineered, consisting of granite wall on wider concrete blocks with piles and buried timber relieving platforms.

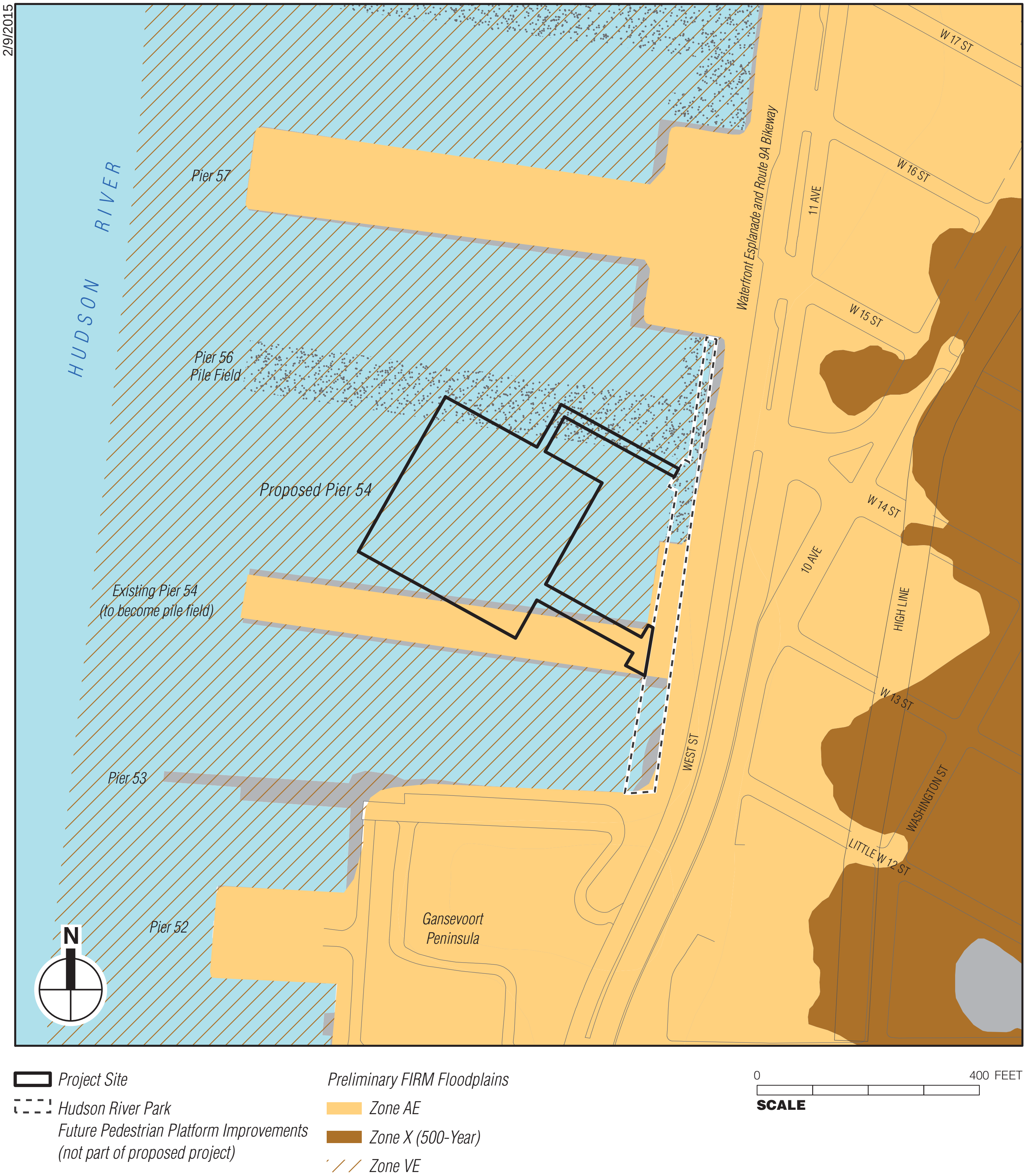
The existing overwater platform limits the potential for tidal marsh plants or submerged aquatic vegetation. No vegetated tidal wetlands are present within the vicinity of the existing platform or the interpier area, and, therefore, no wetlands that would be regulated by the USACE, between Pier 54 and the Pier 56 pile field. As shown in **Figure F-2**, the USFWS National Wetland Inventory classifies the interpier areas surrounding Pier 54 as E1UBL (estuarine subtidal unconsolidated bottom). Subtidal areas are continuously submerged substrates (below extreme low water). Unconsolidated bottoms have at least 25 percent cover of particles smaller than 2.5 or 2.8 inches, and less than 30 percent vegetative cover. There are no NYSDEC mapped tidal wetlands in the vicinity of Pier 54, or the interpier area between Pier 54 and the Pier 56 pile field.

AQUATIC RESOURCES

SURFACE WATER RESOURCES IN THE PROJECT AREA

The study area for the proposed project is located within the Lower Hudson River Estuary, a tidally influenced portion of the Hudson River that is part of the New York/New Jersey Harbor Estuary, which also includes upper and lower New York Harbor, Arthur Kill, Kill Van Kull, East River, Raritan Bay, and Jamaica Bay. Saltwater from Upper New York Bay enters the lower Hudson River Estuary during the flood phase of the tidal cycle and lower salinity water is discharged from the Estuary to the Bay during the ebb phase, resulting in a partially stratified estuary. Tidal flows entering the lower Hudson River from the Upper Harbor during the flood phase are approximately balanced out by the range of fresh water flows (NYCDEP 2007a). Freshwater and higher salinity waters are well mixed during low-flow conditions but are stratified under high-flow conditions when the freshwater overrides the saltwater layer (Moran and Limburg 1986). Ristich et al. (1977) classified the lower Hudson River Estuary as polyhaline (18 to 30 parts per thousand (ppt)) in late summer and autumn, and mesohaline (5 to 18 ppt) in spring and early summer. The typical tidal range on the Hudson River is approximately 5 feet with average tidal currents of approximately 2 feet per second (Geyer and Chant 2006). Within the project site, water depths at mean low water

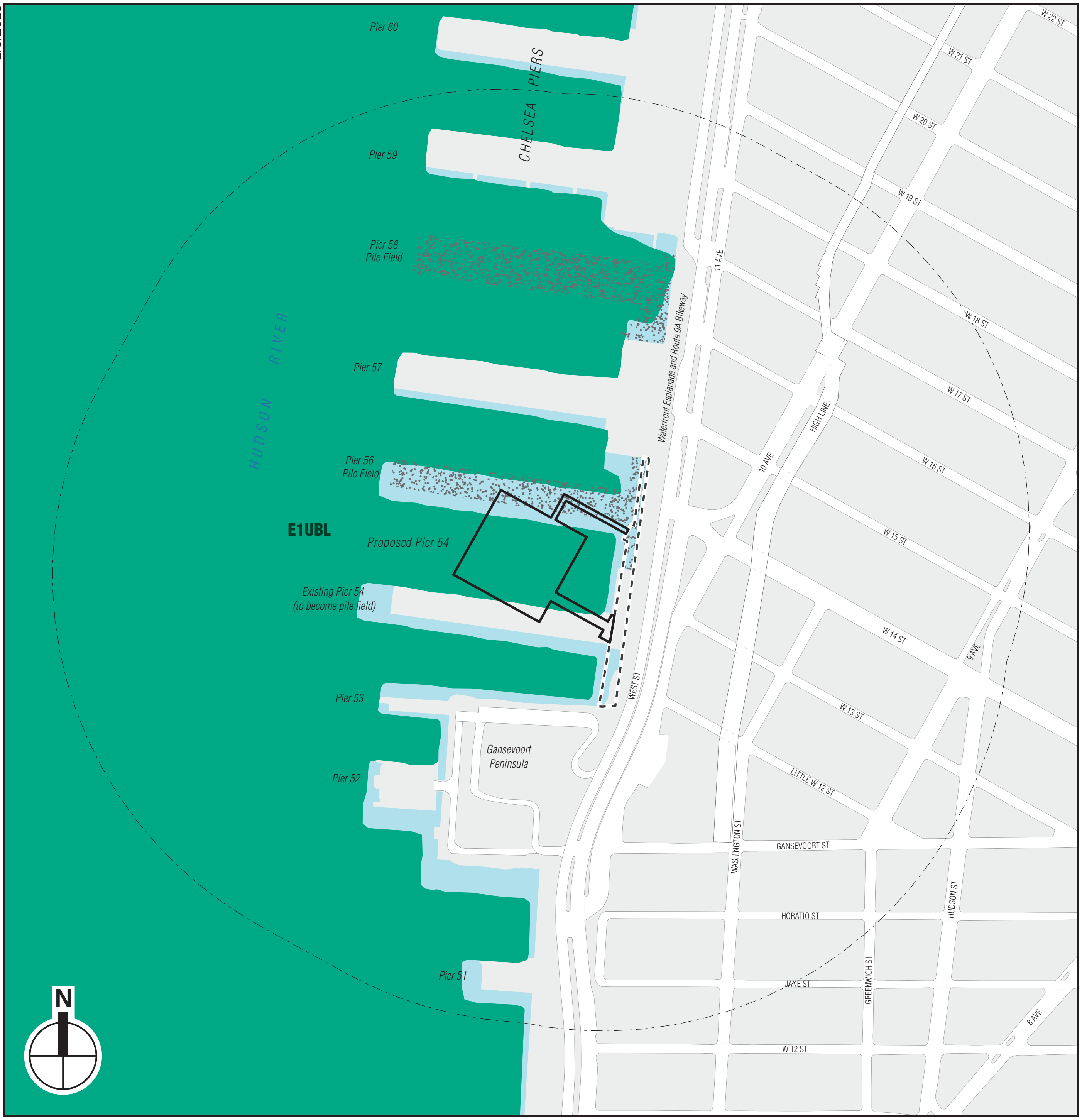
2/9/2015



Hudson River Park Pier 54 Redevelopment

FEMA - Preliminary Floodplains

Figure F-1



Project Site

1/4-Mile Study Area

Hudson River Park
Future Pedestrian Platform Improvements
(not part of proposed project)

NWI Wetlands - Estuarine and Marine Deepwater

0 400 FEET
SCALE

Hudson River Park Pier 54 Redevelopment

National Wetlands Inventory
Mapped Wetlands
Figure F-2

(MLW) range from less than 4 feet at the bulkheaded shoreline, to between 5 and 10 feet north and south of the existing Pier 54, and over 20 feet near the U.S. Pierhead line.

Approximately 1.6 acres of the project site comprises under pier aquatic habitat beneath the existing Pier 54. This assessment also considers the open water interpier habitat north and south of Pier 54. The remaining aquatic habitat within the vicinity of the proposed Pier 54 relocation consists of open water and pile field.

WATER QUALITY

Title 6 of the NYCRR Part 703 includes surface water standards for each use class of New York surface waters. The lower Hudson River is Use Classification I saline surface waters. Best usages for Use Class I waters are secondary contact recreation and fishing. Water quality should be suitable for fish propagation and survival.

The results of recent Harbor Surveys conducted by NYCDEP (NYCDEP 2010, 2012, 2013, 2014) show that the water quality of New York Harbor, including the Lower Hudson Estuary, has improved significantly since the 1970s as a result of measures undertaken by the City (e.g., infrastructure improvement such as major improvements to WWTP and increased capture of stormwater runoff) and others (NYCDEP 2013). Recent water quality data (2009 through 2013) from the NYCDEP Harbor Survey station off West 42nd Street (Station N4), the station closest to Pier 54, indicate that the water quality in this part of the lower Hudson River generally meets the water quality standards for Use Classification I waters (see **Table F-1**). The lower Hudson River has met the fecal coliform standard (an indicator of untreated sewage discharge) for the last 5 years. Average dissolved oxygen (DO)[1] concentrations also met the Use Classification I standards during this same time period. Chlorophyll-*a* concentrations[2] were not indicative of high nutrient concentrations. Secchi transparency[3] during this 5 year period was indicative of low water clarity, likely due to high suspended solid concentrations of surface waters (NYCDEP 2013, 2014).

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[1] DO in the water column is necessary for respiration by aquatic biota. The bacterial breakdown of high organic loads can deplete DO and result in low DO levels. Persistently low DO can degrade habitat and affect aquatic biota. Consequently, DO is one of the most universal indicators of overall water quality in aquatic systems.

[2] High levels of nutrients can lead to excessive plant growth (a sign of eutrophication) and depletion of DO. Concentrations of the plant pigment chlorophyll-*a* in water can be used to estimate productivity and the abundance of phytoplankton. Chlorophyll-*a* concentrations greater than 20 micrograms per liter (µg/L) are considered suggestive of eutrophic conditions (NYCDEP 2010b).

[3] Secchi transparency is a measure of the clarity of surface waters. Transparency greater than 5 feet (1.5 meters) indicates relatively clear water. Decreased clarity can be caused by high suspended solid concentrations or blooms of plankton. Secchi transparencies less than 3 feet (0.9 meters) may be considered indicative of poor water quality conditions. Average Secchi readings in the Inner Harbor area have remained relatively consistent since measurement of this parameter began in 1986, ranging between approximately 3.5 and 5.5 feet (1.1 to 1.8 meters) (NYCDEP 2012).

Table F-1
NYCDEP Water Quality Data for the West 42nd Street Sampling Station (2009–2013)

Parameter—[*Use Class I Standard*]	Top Waters			Bottom Waters		
	Low	High	Avg	Low	High	Avg
Temperature (°C) [*No Standard*]	0.2	27.1	19.0	2.8	25.4	17.6
Salinity (psu) [*No Standard*]	0.2	23.9	13.7	0.2	27.3	22.5
Fecal coliform (colonies per 100mL) [*Monthly geometric mean less than or equal to 2,000 colonies/100 milliliters (mL) from five or more samples*]	4	4000(1)	240	N/M	N/M	N/M
Dissolved oxygen (DO) (mg/L) [*Never less than 4 mg/L*]	0.7	14.7	6.9	0.6	12.0	5.8
Secchi transparency (ft) [*No Standard*]	0.5	5	2.1	N/A	N/A	N/A
Chlorophyll *a* (μg/L) [*No Standard*]	0.3	22.2	4.03	N/M	N/M	N/M

Notes: N/M = not measured, N/A = not applicable.
(1) Compliance with the fecal coliform standard is based on a monthly geometric mean (for which the data are not available to calculate) and not on the basis of the high fecal coliform value presented here which is the maximum fecal coliform value obtained during weekly sampling events. This maximum value occurred in 2011, a year characterized by higher than usual precipitation; geometric means during this year still met the fecal coliform standard (NYCDEP 2012).
Source: NYCDEP 2014

Suspended sediments vary with season and weather—near bottom concentrations range between 100 and 200 milligrams per liter (mg/L) in summer, 100 to 400 mg/L during high discharge periods, and greater than 800 mg/L at times of maximum flow. Sedimentation in the lower Hudson River is greatest in the shallows on the west side of the river (Geyer 1995). The mean sedimentation rate for the portion of the estuary just north of Pier 54, at Pier 76 adjacent to 34th Street, has been estimated at 4.1 inches/year, with higher sedimentation rates occurring in the underpier areas than in the interpier areas (EEA 1988). Within the lower Hudson River Estuary, surface and bottom water pH ranges from 7.0 to 8.0 throughout the year (Stubin 1996; Brosnan and O'Shea 1995).

SEDIMENT QUALITY

Complex flow patterns lead to widely variable sediment characteristics throughout the area. The primary constituents of Hudson River sediments are silt and clay (USACE 1999, EEA 1988). Typical of any urban watershed, New York Harbor Estuary sediments are contaminated due to a history of industrial uses in the area. The sediment quality index (based on sediment toxicity, sediment contaminants, and total organic carbon) for the portion of the Hudson River near Pier 54 was rated poor during 2000-2001 sampling (USEPA 2007). The Lower Hudson River Estuary is listed as being impaired for sediments, which are contaminated with PCBs and other toxics (NYSDEC 2013). Contaminants found throughout the New York Harbor Estuary include pesticides such as chlordane and DDT, metals such as mercury, cadmium, lead, and copper, polychlorinated biphenyls (PCBs) and various polycyclic aromatic hydrocarbons (Rohmann and Lilienthal 1987). Biological effects, identified based upon the benthic invertebrate community, were found to be associated with the chemical contamination. While the sediments of the New York Harbor Estuary are contaminated, the levels of most sediment contaminants (e.g., dioxin, DDT, PCBs, and mercury) have decreased on average by an order of magnitude over the past 30 years mainly due to control measures implemented through the Clean Water Act (Steinberg et al.

2004). The National Estuary Program Coastal Condition Report (USEPA 2007) rates overall New York/New Jersey Harbor sediment quality, including the area in the vicinity of the study area, as poor, based on sediment toxicity, sediment contamination, and/or total organic carbon.

A manufactured gas plant was located east of Route 9A between West 16th and West 18th Streets. No signs of manufactured gas plant-related contamination have been found in soil or groundwater samples collected in upland areas close to the project site. Although deeper contamination in soil or sediment is possible, the proposed project does not involve deep soil disturbance or dredging.

AQUATIC BIOTA

The New York/New Jersey Harbor Estuary, including the lower Hudson River Estuary, supports a diverse and productive aquatic community of over 100 species of finfish, more than 100 invertebrate species, and a variety of phytoplankton and zooplankton. The following sections provide a brief description of the aquatic biota found in the Harbor Estuary, focusing on the lower Hudson River.

Primary Producers

Phytoplankton

Phytoplankton are microscopic plants whose movements within the system are largely governed by prevailing tides and currents. Light penetration, turbidity, and nutrient concentrations are important factors in determining phytoplankton productivity and biomass. Diatoms such as *Skeletonema costatum* and *Thalassiosira* spp. generally dominate the phytoplankton community within the project area, with lesser contributions from dinoflagellates and green algae (Brosnan and O'Shea 1995). Phytoplankton sampling in the Lower Hudson River over a 10-year period between 1991 and 2000 resulted in the collection of a total of 71 taxa. The most frequently collected taxa were *Nannochloris atomus* (found in 98 percent of the samples) and *Skeletonema costatum* (52 percent) (NYCDEP 2007a). Phytoplankton sampling near Pier 26 on the Hudson River from 1996 through 2003 indicated that the most dominant species were *Asterionella japonica, Chaetoceros subtilis, Coscinodiscus excentricus, Ditylum brightwelli, Eucampia zodiacus,* cf. *Gyrosigma* sp., *Nitzchia reversa,* cf. *Pseudonitzchia seriata, Rhizosolenia setigera,* and *Ebria* tripartite (Levandowsky and Vaccari 2004). While nutrient concentrations in most areas of New York Harbor are very high, low light penetration has often precluded the occurrence of phytoplankton blooms.

Submerged Aquatic Vegetation and Benthic Algae

Limited light penetration also restricts the distribution of submerged aquatic vegetation (SAV) in the vicinity of the project site (Olson et al. 1996). The extensively developed shoreline and swift currents also severely limit inhabitation of this area by SAV. Benthic macroalgae are large multicellular algae that are important primary producers in the aquatic environment. Species of macroalgae that occur in the Harbor Estuary include sea lettuce (*Ulva* spp.), green fleece (*Codium fragile*), and brown algae (*Fucus* spp.) (PBS&J 1998).

Zooplankton

Zooplankton are an integral component of aquatic food webs—they are primary grazers on phytoplankton and detritus material, and are themselves used by organisms of higher trophic levels as food. The higher-level consumers of zooplankton typically include forage fish, such as bay anchovy (*Anchoa mitchilli*), as well as commercially and recreationally important species, such as striped bass (*Morone saxatilis*) and white perch (*Morone americana*) during their early life stages. Zooplankton sampling in the Hudson River over a 10-year period between 1991 and 2000 resulted in the collection of a total of 16 taxa. The most frequently collected taxa were *Tintinnopsis* spp (31 percent) and nauplius of copepods (25 percent) (NYCDEP 2007a).

Benthic Invertebrates

The major groups of benthic invertebrates collected in the estuary include aquatic earthworms (oligochaetes), segmented worms (polychaetes), snails (gastropods), bivalves, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp (EEA 1988; EA Engineering Science and Technology 1990; Coastal 1987; PBS&J 1998). Bain et al. (2006) collected a total of 145 benthic invertebrate taxa within Hudson River Park between July 2002 and June 2004. Examples of abundant species include the polychaetes *Mediomastus* spp., *Streblospio benedicti*, *Leitoscoloplos* spp., *Heteromastus* sp., *Spio setosa*, and *Tharyx* spp.; the bivalves *Mulinia lateralis* and *Tellina agilis*; oligochaetes; the gastropods *Acteocina canaliculata* and *Rictaxis punctostriatus*; and the crustacean *Leucon americanus*. This invertebrate sampling showed an unusually abundant and diverse invertebrate community at a sampling station just downstream of Pier 54, adjacent to 12th Street (Bain et al. 2006).

Fish

New York City is located at the convergence of several major river systems, all of which connect to the New York Bight portion of the Atlantic Ocean. This convergence has resulted in a mixture of habitats in the Harbor Estuary and lower Hudson River that supports marine fish, estuarine fish, anadromous fish (fish that migrate up rivers from the sea to breed in freshwater), and catadromous fish (fish that live in freshwater but migrate to marine waters to breed). **Table F-2** lists fish species known to occur within the Harbor Estuary and have the potential to occur in the vicinity of Pier 54. Bain et al. (2006) collected 41 species of fish from within the Hudson River Park Estuarine Sanctuary between June 2002 and June 2004. These species are indicated in **Table F-2**. Bay anchovy, Atlantic herring (*Clupea harengus*), striped bass, and blueback herring (*Alosa aestivalis*) were most abundant. All of these species use open waters (Bain et al. 2006). The sampling station south of Gansevoort Street near 12th Street had the highest fish abundance of all sites sampled (Bain et al. 2006). Abundance of pelagic[1] fish species within the portion of the study area under the existing Pier 54 has been reported to be low compared to other locations within the park, possibly due to dense pile structure, noticeable reduction in current velocity, and closeness of the underdeck to the water surface under the existing Pier 54 (Grothues 2014).

[1] Fish species that prefer open water habitats as opposed to those that associate with the bottom or in-water structures.

Table F-2
Finfish Species With the Potential to Occur in the Vicinity of Pier 54

Common Name	Scientific Name
Alewife[1]	*Alosa pseudoharengus*
American eel[1]	*Anguilla rostrata*
American sand lance	*Ammodytes hexapterus*
American shad[1]	*Alosa sapidissima*
Atlantic cod	*Gadus morhua*
Atlantic croaker[1]	*Micropogonias undulatus*
Atlantic herring[1]	*Clupea harengus*
Atlantic mackerel	*Scomber scombrus*
Atlantic menhaden[1]	*Brevoortia tyrannus*
Atlantic moonfish	*Selene setapinnis*
Atlantic needlefish	*Strongylura marina*
Atlantic seasnail	*Liparis atlanticus*
Atlantic silverside[1]	*Menidia menidia*
Atlantic sturgeon	*Acipenser oxyrhynchus*
Banded killifish	*Fundulus diaphanous*
Bay anchovy[1]	*Anchoa mitchilli*
Black sea bass	*Centropristis striata*
Blackfish	*Tautoga onitis*
Blueback herring[1]	*Alosa aestivalis*
Bluefish[1]	*Pomatomus saltatrix*
Butterfish[1]	*Peprilus triacanthus*
Clearnose skate	*Raja eglanteria*
Conger eel	*Conger oceanicus*
Crevalle jack	*Caranx hippos*
Cunner[1]	*Tautogolabrus adspersus*
Fawn cusk eel	*Lepophidium cervinum*
Feather blenny[1]	*Hypsoblennius hentzi*
Fourbeard rockling	*Enchelypus cimbrius*
Foureye butterflyfish	*Chaetodon capistratus*
Four-spot flounder	*Paralichthys oblongus*
Gizzard shad[1]	*Dorosoma cepedianum*
Goosefish[1]	*Lophius americanus*
Grey snapper	*Lutjanus griseus*
Grubby(1)	*Myoxocephalus aenaeus*
Gulf Stream flounder(1)	*Citharichthys arctifrons*
Hickory shad(1)	*Alosa mediocris*
Hogchoker(1)	*Trinectes maculatus*
Inshore lizardfish	*Synodus foetens*
Lined seahorse[1]	*Hippocampus erectus*
Little skate	*Raja erinacea*
Longhorn sculpin	*Myoxocephalus octodecimspinosus*
Lookdown[1]	*Selene vomer*
Mummichog	*Fundulus heteroclitus*
Naked goby	*Gobiosoma bosci*
Northern stargazer[1]	*Astroscopus guttatus*

Table F-2 (cont'd)
Finfish Species With the Potential to Occur in the Vicinity of Pier 54

Common Name	Scientific Name
Northern kingfish(1)	*Menticirrhus saxatilis*
Northern pipefish(1)	*Syngnathus fuscus*
Northern puffer	*Sphoeroides maculatus*
Northern searobin(1)	*Prionotus carolinus*
Orange filefish	*Aluterus schoepfi*
Oyster toadfish	*Opsanus tau*
Planehead filefish	*Monacanthus hispidus*
Pollock	*Pollachius virens*
Rainbow smelt	*Osmerus mordax*
Red hake(1)	*Urophycis chuss*
Rock gunnel	*Pholis gunnellus*
Rock sea bass(1)	*Centropristis philadelphica*
Rough scad	*Trachurus lathami*
Scup(1)	*Stenotomus chrysops*
Seaboard goby(1)	*Gobiosoma ginsburgi*
Sheepshead	*Archosargus probatocephalus*
Short bigeye	*Pristigenys alta*
Silver hake(1)	*Merluccius bilinearis*
Silver perch	*Bairdiella chrysoura*
Smallmouth flounder	*Etropus microstomus*
Spot(1)	*Leiostomus xanthurus*
Spotfin butterflyfish	*Chaetodon ocellatus*
Spotted hake(1)	*Urophycis regia*
Striped anchovy(1)	*Anchoa hepsetus*
Striped bass(1)	*Morone saxatilis*
Striped burrfish	*Chilomycterus schoepfi*
Striped cuskeel	*Ophidion marginatum*
Striped killifish	*Fundulus majalis*
Striped mullet	*Mugil cephalus*
Striped searobin(1)	*Prionotus evolans*
Summer flounder(1)	*Paralichthys dentatus*
Tautog	*Tautoga onitis*
Threespine stickleback	*Gasterosteus aculeatus*
Tomcod(1)	*Microgadus tomcod*
Weakfish(1)	*Cynoscion regalis*
White hake	*Urophycis tenuis*
White mullet	*Mugil curema*
White perch(1)	*Morone americana*
Windowpane(1)	*Scophthalmus aquosus*
Winter flounder(1)	*Pseudopleuronectes americanus*
Yellowtail flounder	*Limanda ferruginea*

Notes: (1) Collected within Hudson River Park by Bain et al. (2006) from June 2002 through June 2004.
Sources: Bain et al. 2006; Woodhead 1990; EEA 1988; EA Engineering, Science & Technology 1990; LMS 1994, 1999, 2002, 2003a, 2003b; Able et al. 1995

ESSENTIAL FISH HABITAT (EFH)

The NMFS designates EFH within 10' x 10' squares identified by latitude and longitude coordinates. Pier 54 is within a portion of the Hudson River estuary EFH that is situated in the NMFS 10' x 10' square with coordinates (North) 40°50.0' N, (East) 74°00.0' W, (South) 40°40.0' N, (West) 74°10.0' W. This square includes the following waters: the Hudson River and Bay from Guttenberg, NJ south to Jersey City, NJ, including the Global Marine Terminal and the

Military Ocean Terminal, Bayonne, NJ, Hoboken, NJ, Weehawken, NJ, Union City, NJ, Ellis Island, Liberty Island, Governors Island, the tip of Red Hook Point on the west tip of Brooklyn, NY, and Newark Bay. **Table F-3** lists the species and life stages of fish identified as having EFH in the portion of the Hudson River near the project site. EFH habitat was identified for smooth dogfish in the immediate vicinity of Pier 54 (NOAA 2010a).

Table F-3
Essential Fish Habitat Designated Species in the Vicinity of Pier 54

Species	Eggs	Larvae	Juveniles	Adults
Red hake (*Urophycis chuss*)		x	x	x
Winter flounder (*Pseudopleuronectes americanus*)	x	x	x	x
Windowpane flounder (*Scopthalmus aquosus*)	x	x	x	x
Atlantic herring (*Clupea harengus*)		x	x	x
Bluefish (*Pomatomus saltatrix*)			x	x
Atlantic butterfish (*Peprilus triacanthus*)		x	x	x
Atlantic mackerel (*Scomber scombrus*)			x	x
Summer flounder (*Paralicthys dentatus*)		x	x	x
Scup (*Stenotomus chrysops*)	x	x	x	
Black sea bass (*Centropristus striata*)	n/a		x	x
King mackerel (*Scomberomorus cavalla*)	x	x	x	x
Spanish mackerel (*Scomberomorus maculatus*)	x	x	x	x
Cobia (*Rachycentron canadum*)	x	x	x	x
Clearnose skate (*Raja eglanteria*)			x	x
Little skate (*Leucoraja erinacea*)			x	x
Winter skate (*Leucoraja ocellata*)			x	x
Bluefin tuna (*Thunnus thynnus*)	x	x	x	x
Smooth dogfish (*Mustelus canis*)	x	x	x	x
Sand tiger shark (*Odontaspis taurus*)		x(1)		
Dusky shark (*Charcharinus obscurus*)		x(1)		
Sandbar shark (*Charcharinus plumbeus*)		x(1)		x

Notes:
n/a – insufficient data for this lifestage exists and no EFH designation has been made.
(1) Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger, dusky, and sandbar sharks refers to neonates and early juveniles.
Source:
National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the Internet at http://www.nero.noaa.gov/hcd/STATES4/new_jersey/40407400.html and http://www.nero.noaa.gov/hcd/skateefhmaps.htm
National Marine Fisheries Service EFH Mapper accessed online at http://www.habitat.noaa.gov/protection/efh/habitatmapper.html

THREATENED OR ENDANGERED SPECIES, OR SPECIAL CONCERN SPECIES

The New York Natural Heritage Program identified shortnose sturgeon (*Acipenser brevirostrum*) (state/federal endangered) and peregrine falcon (*Falco peregrinus*) (state endangered) as having the potential to occur within the vicinity of the project site (NYNHP 2014; see Appendix A, "Agency Correspondence"). NMFS (2014, see Appendix A) identified adult and subadult shortnose sturgeon and Atlantic sturgeon *(Acipenser oxyrinchus oxyrinchus,* federal endangered) as having the potential to be present within the Hudson River in the vicinity of the project site. Shortnose sturgeon would likely be using the Lower Hudson River as a migration corridor to and from foraging, overwintering and/or spawning grounds located upstream of the project site. Due to the distance from shortnose sturgeon spawning grounds in the Hudson River, and the higher salinity of the river in the vicinity of the projects site, shortnose sturgeon eggs or larvae and young of the year would not occur near the project site. The Lower Hudson River in the vicinity of the project site is not a known overwintering, spawning or foraging ground for Atlantic sturgeon, and early life stages of this species are not expected to occur (NMFS 2014) and USFWS (2014) has identified northern long-eared bat

(*Myotis septentrionalis*, proposed federal endangered) as possibly occurring within the vicinity of the project site (see Appendix A). This forest-dependent bat species would not be present within the interpier habitat of the project site, and therefore would have not potential to be affected by the proposed project In addition, four state and federally listed species of marine turtles—loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), and leatherback (*Dermochelys coriacea)*; have the potential to occur as occasional transients within the vicinity of the project site (AKRF, Inc. et al. 1998).

A pair of nesting peregrine falcons nested at Pier 57 in 2009, the pier immediately north of the project site (NYSDEC 2012) but have not nested at this location in recent years.

The federally listed and state listed endangered shortnose sturgeon is an anadromous bottom-feeding fish that can be found throughout the Hudson River system. These fish spawn, develop, and overwinter well upriver of Pier 54, and prefer colder, deeper waters for all lifestages. Shortnose sturgeon may occassionally use areas of the lower Hudson River downstream of the George Washington Bridge; however, spawning, nursery, and overwintering areas are located well upstream of the proposed project (Bain et al., 2007). The Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 1997).

The Hudson River shortnose sturgeon population was estimated to contain approximately 61,000 fish (Peterson and Bain 2002). Although larvae can be found in brackish areas of the river, the juveniles (fish ranging from two to eight years old) are predominately confined to freshwater reaches above the downriver saline area and far upriver from the project site. The primary summer habitat for shortnose sturgeon in the middle section of the Hudson River Estuary (far upriver of Pier 54) is the deep river channel (43 to 138 feet deep) (Bain 1997).

Long-term Hudson River monitoring data, collected by the New York Utilities and others since the 1970s, have also indicated that shortnose sturgeon inhabit deep-water habitats and occur in greatest abundance north of the Tappan Zee Bridge. Hoff et al. (1988 in Bain 2007) reported most captures of adult shortnose sturgeon during river monitoring of fish distributions by the Hudson River electric utilities from 1969 to 1980 occurred upriver of the project site, between river mile 23.6 and 76 (river kilometer 38 and 122) (from near the New York/New Jersey border up to near Poughkeepsie). No sturgeon were found in interpier areas of the Hudson River Park, sampled between June 2002 and March 2004 (Bain et al. 2006).

However, during winter sampling in 2003–2004 and 2004–2005, bottom trawls conducted in the Hudson River channel as part of the New York Utilities long-term monitoring program collected shortnose sturgeon south of the George Washington Bridge (river mile 11.8, or river kilometer 19). These are the first two years that shortnose sturgeon have occurred in this portion of the lower Hudson River during the winter period since the start of this monitoring program in 1985. Out of the 700 to 1,000 tows collected annually during this winter period, a total of 15 and 18 shortnose sturgeon were collected during the 2003–2004 and 2004–2005 periods, respectively, between the Statue of Liberty and the George Washington Bridge. These sturgeon were collected within the channel, not in interpier areas, such as the site of the proposed project. All but two individuals were collected north of Pier 54 (Young 2005; Mattson 2005), suggesting that shortnose sturgeon are still rare in the lower portion of the Hudson River in the vicinity of the project site.

The Atlantic sturgeon is an anadromous species that occurs within the New York Harbor Estuary (Woodhead 1990) and the Hudson River Estuary. In the Hudson River, Atlantic sturgeon are found in the deeper portions and do not occur further upstream than Hudson, New York. Atlantic sturgeon migrate from the ocean upriver to spawn above the salt front from April to early July (Smith 1985; Stegemann 1999). Female sturgeon move out of the river following spawning but the males may remain in the river until October or November.

Marine mammals use the waters of the New York Bight, and occasionally come into New York Harbor, but are not commonly observed in the Lower Hudson River Estuary. The most commonly observed marine mammal in the Bight is the harbor seal (*Phoca vitulina*) which winters in the Harbor and hauls out onto islands in Jamaica Bay, Sandy Hook, Staten Island, and the Westchester and Connecticut shorelines of Long Island Sound. Less frequently, but seen in similar locations, is the grey seal (*Halichoerus grypus*). Seals are also known to be seasonally present within the Hudson River (AKRF, Inc. et al. 1998). A harp seal (*Pagophilus groenlandicus*) was observed within the Hudson River Park in the winter of 2005. The occasional sightings of cetaceans (e.g., dolphins and whales) in the Harbor are generally of individuals that are likely to be unhealthy and/or lost. Records indicate the harbor porpoise (*Phocoena phocoena*) may have once been a regular visitor to the Harbor (USFWS 1997).

Four species of marine turtles—loggerhead, green, Kemp's ridley, and leatherback—all state and federally listed occur seasonally in the Harbor Estuary. Federally endangered juvenile Kemp's ridley, and federally threatened large loggerhead turtles enter the New York Harbor and bays in the warmer months each year. Loggerhead, Kemp's ridley, and green turtles move into harbors and estuarine waters. Leatherback turtles tend to remain along the coast and rarely move into embayments (USACE 2001). In general, however, these four turtle species mostly inhabit Long Island Sound and Peconic and Southern Bays. They neither nest in the New York Harbor Estuary, nor reside there year-round (Morreale and Standora 1993). These turtles generally leave New York waters by mid-October and head southward (USACE 2001). It is unlikely that these turtle species would occur in the lower Hudson River within the vicinity of the project area except as occasional transients.

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

The NYSDOS has designated 15 Significant Coastal Fish and Wildlife Habitats within New York City, one of which, the Lower Hudson Reach, is within the vicinity of Pier 54. The Lower Hudson Reach is the portion of the Hudson River starting from Battery Park at the tip of Manhattan and extending north to Yonkers in the vicinity of Glenwood. This area runs for 19 miles and includes deepwater, shallows, piers, and interpier basins. The Lower Hudson Reach was designated a Significant Coastal Fish and Wildlife Habitat because it provides an important wintering habitat for young-of-the-year, yearling, and older striped bass. Significant numbers of other fish species and waterfowl also use the Lower Hudson Reach (NYSDOS 1992). The USFWS (1997) has also designated the Lower Hudson River Estuary (from the Battery at the southern tip of Manhattan up to Stony Point at river mile 41) as a Significant Habitat Complex because it is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine, and marine fish species, including striped bass, and is a migratory and feeding area for birds and fish that feed on the abundant fish and benthic invertebrate resources found in this portion of the estuary. Striped bass is an anadromous species that occurs along the Atlantic coast from Canada to northern Florida. Adult striped bass spend much of the year from summer through late winter in the nearshore coastal waters of the Atlantic Ocean. Northward migration of Hudson River fish along the Atlantic coast extends as far north as the Bay of Fundy, Nova Scotia, with older fish tending to travel farther north (Waldman et al. 1990). Although most migrate to sea, some striped bass adults remain in the Hudson River year-round, never migrating. During winter, these resident adults (ages 4 and older) are joined by migratory adults returning to the estuary to spawn. Adults aggregate near the mouths of their natal rivers and begin moving upstream to spawn as water temperatures increase in the spring.

The Hudson River supports one of several principal spawning populations, which also include Delaware Bay, Chesapeake Bay, the Roanoke and Chowan rivers and Albemarle Sound, North Carolina, the Santee River in South Carolina and the St. Johns River in northern Florida. In the Hudson River, peak spawning typically occurs between mid-May and mid-June in freshwater areas where currents are moderate to swift, specifically in the river reach from Indian Point (river mile 42) upstream to Saugerties (river mile 106) (CHGE et al. 1999; ASA 2010). Depending on their age and size, females produce up to several million pelagic eggs, which based on utilities fish surveys from 1998 to 2007, are collected in May and June primarily upstream of Indian Point at river mile 46, with peak densities near Cornwall (river mile 56 to 61) and very low densities south of the Tappan Zee region. The spawning area is considerably upriver of Pier 54.

Larval striped bass recruit to the lower salinity areas of the Hudson River well upstream of Pier 54 during summer (May to July) and are abundant throughout the Hudson River but occur in higher numbers from Tappan Zee to Hyde Park than in the lower estuary. As juveniles, striped bass begin to move out of the middle estuary into the broader, shallower nursery habitat of the lower estuary (Tappan Zee through Croton-Haverstraw Bays, river mile 24 through 38). Juvenile abundances are typically highest during late summer (July and August) and upstream Hyde Park in deeper (>20-ft) bottom habitats. By the end of their first summer, many juvenile striped bass have moved downstream to the lower estuary and into New York Harbor, western Long Island Sound and along the south shore of Long Island where they remain near shore until November or December (CHGE et al. 1999; Dunning et al. 2009). At this time, some may move to deeper water, although juveniles have been documented to use interpier areas within the Hudson River Park for overwintering habitat from December through March (AKRF, Inc. et al. 1998; Dunning et al. 2009). A significant portion of the juvenile striped bass remains within the lower Hudson Estuary until age two or three. The lower Hudson River, including the area in the vicinity of Pier 54, contains striped bass throughout the year. This portion of the river provides important wintering habitat (mid-November to mid-April) for young-of-the-year, yearling, and older striped bass (Heimbuch et al. 1994, NYSDOS 1992). Striped bass was one of the four most abundant species collected within Hudson River Park from June 2002 through June 2004 (Bain et al. 2006).

At two to three years old, striped bass leave Atlantic coast estuaries and begin the typical seasonal coastal migration, northward during the spring and summer and southward during the fall. Some individuals are thought to mature and remain year-round in the upper freshwater portion of the estuary, while others adopt an anadromous life style and, once sexually mature, spend most of their time in coastal saltwater habitats but enter freshwater and brackish habitats in the spring to spawn (Zlokovitz et al. 2003). Adult striped bass are top predators and are prey to few other animals. Adult striped bass in the Lower Hudson-Raritan Estuary prey upon at least 20 different taxa, dominated by a variety of small-bodied and juvenile fishes and crustaceans (Steimle et al. 2000; Dunning et al. 2009). The coastal stock is healthy, with spawning stock biomass well above the target level specified in the Interstate Fisheries Management Plan (ASMFC 2009) and stocks at historically high levels (NYSDEC 2010c).

TERRESTRIAL RESOURCES

Pier 54 and the surrounding area are dominated by impervious surfaces. Vegetation is scant and limited to linear rows of street trees along the Hudson River Bikeway and in the median of Route 9A. Only the most urban-adapted terrestrial wildlife species are expected to occur near Pier 54, including house sparrow (*Passer domesticus*), European starling (*Sternus vulgaris*), rock dove (*Columba livia*), herring gull (*Larus argentatus*), and Norway rat (*Rattus norvegicus*). Even generalist and disturbance-tolerant native species such as gray squirrel (*Sciurus carolinensis*) and American robin (*Turdus migratorius*) are unlikely to be supported by the limited habitat available in and around the project site.

E. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the No Action condition, Pier 54 and the platform along the bulkhead between Gansevoort and Pier 57 would be replaced in accordance with previously-approved construction authorizations and permits. Reconstruction of Pier 54 in the No Action condition would include driving of 220 new 24-inch square concrete piles spaced with the existing timber piles that will remain to maintain the existing 5 foot by 10 foot grids (i.e., existing timber piles located where new concrete pile is to be driven will be extracted from the river bottom), installation of 361 new fender piles spaced 8 feet apart along the perimeter, and installation of new pile caps and concrete pier platform within the existing footprint. Approximately 240 of the existing 3,471 existing timber piles would be extracted from the river bottom completely as necessary to prevent interference with driving of the new piles and to comply with Special Condition E of the USACE permit for the park. This USACE Permit Special Condition limits changes in pile density beneath repaired or reconstructed piers to up to 10 percent of the number of existing piles beneath the pier to be repaired or reconstructed. In compliance with Special Condition F of the USACE permit for the park, pile extraction would be done in a manner that does not result in substantial sediment resuspension. The remaining timber piles would be left in place under the reconstructed Pier 54 platform but would not provide structural support to the reconstructed pier. The platform work would be completed as part of the separate Pier 54 Connector Project and Pier 57 Project, which are both expected to be complete by 2017.

AQUATIC RESOURCES

The aquatic habitat beneath the current pier and within the interpier areas north and south of the pier consists of littoral zone, benthic habitat that is permanently inundated by tidal waters. The installation of the 220 new concrete piles and removal of selected existing timber piles for the reconstruction of Pier 54 within the same footprint would not adversely affect water quality or release suspended sediment to any degree that could be detrimental to the river substrate's invertebrate infauna/epifauna or finfish that may frequent the area. Release of suspended sediment during pile installation would be localized and temporary. Because the pier would be reconstructed within the existing footprint, there would be no net increase in shading or over-water structures which could impact habitat or diminish phytoplankton productivity. The reconstructed pier would maintain the existing dense pile spacing, with possible tighter spacing in some locations where the new piles would be installed.

The 30-year general trend of improvement in water quality and sediment contamination concentrations of the New York Harbor resulting from improvements in wastewater treatment and control of industrial effluents is expected to continue in the future without the proposed project.

Elements of the New York/New Jersey HEP and other programs such as the HRE Restoration Project that are specifically directed at improving biological resources and habitats, would be expected to result in improvements to natural resources over time. The HRE has identified the Hudson River Park Estuarine Sanctuary as a restoration site. Restoration opportunities identified for the Sanctuary include creation/restoration/enhancement of shallow water habitat and providing environmental interpretation (USACE and PANYNJ 2009, and Hudson River Park Trust 2002). Restoration opportunities pursued within the Sanctuary as part of the HRE would occur in both the No Action and With Action conditions. In addition, as required by USEPA's CSO Control Policy, NYCDEP initiated the development of the Long-Term Control Plan (LTCP) Project in 2004. The LTCP Project integrates CSO Facility Planning Projects and the Comprehensive City-Wide Floatables Abatement Plan, and incorporates ongoing Use and Standards Attainment Program (USA) Project work. The East River and Open Waters Waterbody/Watershed Facility Plan report (NYCDEP 2007) includes measures for controlling combined sewer overflows to the Hudson River and is the first step in developing the LTCP for the open water areas of the New York Harbor. Recent NYSDEP efforts resulting from this plan include monitoring water quality at more than 70 locations; installing depth sensors at more than 115 combined sewer regulators; piloting real-time monitors at five CSO outfalls to estimate CSO volume, duration of overflow, and peak flow during wet weather periods; and installing weather stations at waste water treatment plant. These efforts will result in future improvement in coliform, DO, and floatables levels in the Harbor Estuary.

In addition, efforts to characterize and understand sediment contamination are likely to lead to improvements in sediment quality over time. The Contamination Assessment and Reduction Project (CARP), sponsored by the Port Authority of New York and New Jersey (PANYNJ), focused on understanding the fate and transport of contaminants discharged to the estuary, and using this information to develop measures that may be necessary to reduce sediment contamination. The principal chemicals of concern include dioxins/furans, PCBs, polyaromatic hydrocarbons (PAHs), metals (mercury, cadmium, and methyl mercury), and organochlorine pesticides. Continued research and monitoring programs are anticipated to play a role in the development of future management strategies for Harbor sediments (Landeck Miller et al. 2011).

FLOODPLAINS

The elevation of the authorized Pier 54 reconstruction would be identical to its current elevation, which is about 5 feet below the Preliminary FIRM 100-year flood AE Zone elevation (13 feet NAVD88) and 8 feet below the Preliminary FIRM 100-year flood VE Zone elevation (16 feet NAVD88). During a 100-year storm event, all hardscape, planting and critical infrastructure would be below the flood elevation. The New York City Panel on Climate Change (NPCC) projects that by the 2050s, sea levels could be between 11 and 24 inches higher than they are today, with a high estimate for sea level rise of 30 inches. This high estimate for sea level rise would result in an increase in the flood elevation associated with the 100-year storm from 13 feet NAVD88 to 16 feet NAVD88 near the current Pier 54 location. By the 2080s, NPCC projects increases in sea level of between 18 and 39 inches, with an increase of as much as 58 inches. This high estimate for sea level rise would result in a 100-year flood elevation of 18 feet NAVD88. Replacement of Pier 54 in-kind would not worsen nearshore flooding during storm events nor change the spatial or temporal flooding behavior of the project area.

TERRESTRIAL RESOURCES

Terrestrial resources would not change in the No Action condition, in which Pier 54 provides limited wildlife habitat and limited opportunity for providing vegetation for insect pollinators and bird habitat. In turn, terrestrial wildlife would remain limited to invasive species such as rock dove and Norway rat that thrive in extremely disturbed, urban areas.

F. PROBABLE IMPACTS OF THE PROPOSED PROJECT

In the With Action condition, the existing Pier 54 platform is proposed to be removed and its supporting piles cut above the waterline, resulting in the creation of approximately 1.9 acres of pile field habitat. The reconstructed Pier 54 would be located between the existing Pier 54 and the pile field of former Pier 56. The reconstructed Pier 54 would result in approximately 2.7 acres of overwater structure consisting of a new 320-by-320-foot platform for an overall pier area of 103,913 square feet (2.4 acres), along with two access ramps with an overall surface area of approximately 13,048 square feet (0.3 acres). The increase in overwater coverage with the proposed project as compared with the construction authorization for the Pier 54 reconstruction in the No Action condition would be 0.8 acres.

Both the new pier platform and access ramps would be supported on new piles installed in the river substrate (see **Table F-4**). These piles would consist of 264 concrete main structural piles under the pier platform, each 36 inches in diameter spaced approximately 20 feet apart on center; 44 access ramp piles, each 24 inches square of precast concrete; 56 other structural piles for the amphitheater support area , each 20 or 24 inches square of precast concrete; 2 24-inch diameter concrete-filled steel mooring piles and 6 36-inch diameter concrete-filled steel pipe breasting piles with floating donut fender to moor the up to 4,000-sf vessel during the performance season, 14 24-inch square precast concrete piles for the seasonal vessel dock, 9 24-inch square precast concrete piles for the southern balcony, and a separate row of eight fendering piles to protect the structure, each consisting of 19 piles (three 14-inch steel piles and sixteen 12-inch timber piles) The footprint of these piles totals 2,502 square feet (0.06 acres). Approximately 880 square feet of shaded bottom habitat would be disturbed during driving of the concrete piles to support the reconstructed Pier 54 in the No Action Condition. The elevation of the pier would range from a lower elevation of +7.65 NAVD88 at the amphitheater support space, +9.65 NAVD88 at the low point of the pier deck at the floor of the amphitheater to a high point of the pier deck of +63.65 NAVD88.

Table F-4
Approximate Number of In-Water Piles

Pile Type	Structure/Use	Number of Piles (#)	SQFT (total)
Square Precast Concrete Pile (24")	South Accessway	20	80
Square Precast Concrete Pile (24")	South Balcony	9	36
Square Precast Concrete Pile (24")	North Accessway	24	96
Round Precast Concrete Pile 36" Diameter	Pier Platform	264(1)	1,866(2)
Square Precast Concrete Pile (24")	Undercroft	38	152
Square Precast Concrete Pile (20")	Undercroft	18	50
Square Precast Concrete Pile (20")	Seasonal Vessel Dock	14	39
Concrete Filled Steel Pipe Breasting Pile 36" Diameter	Seasonal Vessel Dock	6	42
Concrete Filled Steel Pipe Mooring Dolphin 24" Diameter	Seasonal Vessel Dock	2	6
Timber Pile 12" Diameter	Protective Fender Pile Cluster	128	101
Steel Pipe Pile 16" Diameter	Protective Fender Pile Cluster	24	34
	TOTAL	547	2,502

Notes: (1) Because of the undulating topography, only 173 out of 264 piles have flowable concrete below MHW**;** (2) For the piles in which flowable concrete occurs below MHW, the area occupied by the flowable concrete within the 24 inch diameter space of the piles totals 543.22 square feet.

See **Figures A-2** and **A-3** for the location and footprint of the new pier and **Figure A-13** for the proposed pile locations.

As discussed in greater detail in Attachment A, "Project Description and Environmental Analysis," Pier 54 would be engineered as a rolling landscape occupied by lawns, planted areas of shrubs and trees, and paved walking/seating areas. The soil used as a planting medium for the landscape areas of the pier would be stabilized via geofibers and densely rooted shrubs and ground covers. Stormwater drainage infrastructure would be incorporated in the pier design to convey runoff from the impervious and pervious surfaces to the Hudson River, as described in greater detail below.

Construction of the proposed project would start in 2016 and would be complete by 2019. Pile driving would occur over two pile driving seasons between May 1and October 31, in 2016 and 2017, outside of the November 1 to April 30 window in which pile driving is prohibited by the USACE and NYSDEC permits issued for Hudson River Park. To finish pile driving in two 6-month seasons, up to three barge-based construction crews would work concurrently. Pile driving crews would typically drive three 36-inch piles, six 24-inch piles, or some combination of the two, per day.

Each crew would have an approximately 60-by-180-foot crane barge with impact hammer to drive the piles, and the same size material barge. The barges would not remain at a single location for more than a few days. Because the bottom material is soft organic silt, driving the piles to bedrock is anticipated to take about 15 minutes per pile, with the remaining time used for positioning the barges, installing the pile driving template, standing the piles off and cutting piles when seated into the bedrock. Previous pile driving within Hudson River Park, such as at Pier 53 has not resulted in noticeable mud line disturbance.

Prior to driving each pile, a multi-tiered template supported on temporary steel piles would be installed using a crane barge at the pile location to achieve greater pile driving precision. To the greatest extent possible the sections comprising the concrete piles would be spliced on a barge, or in the shop, and lifted as one unit by the crane barge for installation in place within the template. However, where the bedrock is too far below the mudline, the pile would be installed in two pieces: a steel H-pile (called a stinger) is driven first, the concrete pile is bolted or spliced on top of the stinger, and then the concrete pile is driven to the design depth. The splicing connection seals the bottom of the concrete pile such that at the completion of driving the pile is empty. Piles with a final length that does not exceed approximately 130 feet would be installed open ended—a concrete cylinder with an open bottom driven to bedrock. These concrete piles would have mud inside to the mudline elevation. In a typical operation it might take one day, or more, to set up the driving frame, one day to lift and drop the piles into it, and a few hours to drive the piles down, with seating of the pile into bedrock with the hammer anticipated to take about 15 minutes per pile. After the piles are installed, and the driving frame is still in place, the piles would be cut-off at the locations where they fetched-up higher than intended.

Construction of the overwater pier components would continue until spring of 2018, and upland park construction (walls, soil, utilities, paving, railing, planting, etc.) would be completed by early summer of 2019.

The following sections discuss the potential for the construction and operation of the proposed project to result in impacts to natural resources.

FLOODPLAINS

As discussed in “Existing Conditions,” the existing platform elevation for Pier 54, and the elevation of the authorized Pier 54 reconstruction would be about 5 feet below the Preliminary FIRM 100-year flood elevation. The proposed project would be about 8 feet below the Preliminary FIRM 100-year flood elevation (Zone VE, 16 feet NAVD88) at the amphitheater support space (approximately 4,010 square feet below the BFE), and about 6 feet below the Preliminary FIRM 100-year flood elevation (Zone VE) at the low point of the pier deck (the floor of the amphitheater, approximately 2,725 square feet below the BFE), and about 48 feet above the Preliminary FIRM 100-year flood elevation at the high point of the pier deck. Approximately 6,735 square feet, or only about 7 percent of the pier, would be below the 100-year flood elevation. Without the interstitial area for the amphitheater support space, about 97 percent of the pier would be above the 100-year flood elevation, compared to 0 percent of the reconstructed Pier 54 in the No Action condition.

New York City is affected by local (e.g., flooding of inland portions of the city from short-term, high-intensity rain events in areas with poor drainage), fluvial (e.g., rivers and streams overflowing their banks), and coastal flooding (e.g., long and short wave surges that affect the shores of the Atlantic Ocean, bays such as Upper New York Bay, and tidally influenced rivers such as the Hudson River and East River, streams, and inlets [FEMA 2013]). Because the portion of the Hudson River within the study area is tidal, the water level of this portion of the river is controlled by the tidal conditions within the New York Bay and the Atlantic Ocean and is not influenced by freshwater flow from upriver. Within New York City, tidal flooding is the primary cause of flood damage. The floodplain within and adjacent to the study area is affected by coastal flooding and would not be affected by construction or regrading/filling of the floodplain as would occur within a riverine floodplain[1]. Coastal floodplains are influenced by astronomic tide and meteorological forces (e.g., northeasters and hurricanes [FEMA 2013]) and not by fluvial flooding. Therefore, the proposed project would not have the potential to result in significant adverse impacts to the 100-year floodplain or result in additional flooding adjacent to the pier.

Attachment B, "Land Use, Zoning, and Public Policy," assesses the consistency of the proposed project with the New York City Waterfront Revitalization Program, and resiliency with respect to sea level rise. The New York City Panel on Climate Change (NPCC) projects that by the 2050s, sea levels would likely be between 11 and 21 inches higher than they are today (based on mid-range projections) and may increase by as much as 30 inches (90th percentile projections). By the 2080s, NPCC projects that sea levels would likely be between 18 and 39 inches higher than they are today (based on mid-range projections) and may increase by as much as 58 inches (90th percentile projections). This would result in an increase in the flood elevation associated with the current 100-year storm from 16 feet NAVD88 (Zone VE) to about 18.5 feet NAVD88 by the 2050s, and 21 feet NAVD88 by the 2080s (assuming the high estimate of sea level rise). While only limited portions of the proposed project (primarily the interstitial space) would be located below the current 100-year flood elevation and the projected elevation with sea level rise, critical infrastructure would be either located above 21 feet NAVD88 or would be designed with flood resistant materials such that they could withstand flooding.

The material selected for the amphitheater support space would be compatible with submergence in the marine environment. The central performance space and the access ramp landings on the pier would be at elevation 16.65 feet NAVD88 which is above the 100-year flood elevation and provides some resilience to the projected sea level rise. The remaining slopes and landscape (with the exception of the amphitheater floor) within the pier are considered to be above the level of anticipated storms. Areas with the potential to be inundated in the event of flooding would be hardened and therefore resilient to damage under these circumstances. The access ramps would also use materials that can withstand saline inundation, and utilities that are anticipated within the access ramps would be encased and dry-floodproofed. Sensitive utilities would be placed above the 100-year flood elevation or will be dry or wet flood-proofed. Plant materials will be selected for their suitability for the anticipated conditions which include salinity from salt spray, winds, solar exposure and human use. The sand-based soils and irrigation system will be designed to recover from flooding.

In 2013, the City's Special Initiative for Rebuilding and Resiliency (SIRR) issued their comprehensive plan and recommendations for rebuilding and increasing resiliency after Superstorm Sandy. For Lower Manhattan, SIRR recommends measures to improve flooding resiliency, including raising the elevation of bulkheads, and implementing Integrated Flood Protection Systems (e.g., terraced berms at the back end of a waterfront park; benches, park walls, flood-proofed buildings or bridge abutments; drainage improvements including valves and gates; and temporary features such as deployable floodwalls). The proposed project would be consistent with the goals of this plan by creating a raised park with greater resilience to flood damage now and in the future with projected sea level rise.

[1] Filling of a riverine floodplain obstructs flood flows, which can result in flooding upstream and on adjacent properties. It also reduces the ability of the floodplain to store excess water which results in more water being sent downstream and increases the elevation of the floodwater.

AQUATIC RESOURCES

WATER AND SEDIMENT QUALITY

Construction

In-water construction activities for the proposed project relating to pile driving (i.e., pile driving and fendering) would occur outside the November 1 to April 30 window in which pile driving is prohibited as a condition in the NYSDEC and USACE permits issued for the development of Hudson River Park. It is anticipated that pile driving activities would be completed within one or two pile driving seasons.

Sediment-disturbing activities associated with the proposed project include pile driving and movement of tugs to position the construction barges. In order to minimize resuspension of bottom sediment, tug movement in areas where water depths would not be sufficient to allow a clearance of at least 2 to 3 feet between the propeller(s) and the bottom sediment would be limited to the extent possible.

All in-water and shoreline construction work would be done using barge-based crews. Consistent with the NYSDEC and USACE permits for in-water work within Hudson River Park, floating debris screens would be in place throughout demolition and construction activities. Sediment disturbance associated with the pile driving would be minimal but if it should occur would have the potential to result in minor, short-term increases in suspended sediment and resuspension and re-deposition of contaminants. Increases in suspended sediment due to pile driving would be temporary and localized, confined to the immediate vicinity of construction activities. The average tidal current in the Hudson River is 1.4 knots (Geyer and Chant 2006). Therefore, any sediment resuspended during pile driving would move away from the area of in-water construction and would dissipate shortly after the completion of pile driving activity. Additionally, the temporary localized increases in suspended sediment during pile driving would be intermittent, occurring during the 15-minute period anticipated for the driving of each new pile followed by a period of no sediment disturbing activity while the next pile is being prepared for installation. Therefore, in-water construction activities due to the proposed project would not result in significant adverse impacts to water quality. Similarly, any contaminants released to the water column as a result of sediment disturbance would dissipate rapidly and would not result in significant adverse long-term impacts to water quality.

Operation

The spacing of the 264 piles for the main platform of the proposed project (about 20 feet on center) would not result in a significant adverse effect to the movement of tidal waters or the DEC-designated use classification of the Hudson River within the project area.

Stormwater runoff from the pier would continue to be discharged to the Hudson River as under the existing and No Action condition, and would not have the potential to result in a failure for the portion of the Hudson River in the vicinity of the project site to meet the water quality criterion for Use Class I waters. By creating a pier with planted areas, the proposed project would result in a reduction in runoff rates to the Hudson River, and an improvement to the quality of stormwater discharged to the river, from the overwater structure as compared to existing conditions and the No Action condition in which runoff from the Pier 54 platform would discharge directly to the Hudson River untreated By reducing runoff rates, the proposed pier has the potential to reduce the concentration of pollutants entering the river. With the proposed project, precipitation that falls on planted areas would be filtered through plant roots and through a sand-based soil medium, improving the quality of the stormwater prior to discharge to the river. In instances where a path or other physical obstruction impedes free flow of water down slopes, underdrains would collect this water and direct it to a collection and discharge point through the pier platform. The large gently sloped lawn area will have an under-drainage system to convey water to discharge points through the pier deck. Irrigation within turf areas would utilize spray heads while irrigation within steep slopes and shrub/ground cover areas would utilize a drip system. The landscape would be maintained using Integrated Pest Management techniques thereby substantially diminishing the need for the use of pesticides and other chemicals. Similarly, turf would be maintained without the use of herbicides and fungicides. Therefore, the discharge of stormwater runoff from the proposed project would not result in significant adverse impacts to water quality of the Hudson River.

AQUATIC BIOTA

Construction Impacts

The in-water construction activities described above under “Water Quality,” have the potential to result in temporary adverse impacts to fish and macroinvertebrates due to the following:

- Temporary increases in suspended sediment;
- Loss of benthic habitat within pile footprints; and
- Other impacts associated with pile driving.

In-water pile driving for the proposed project would be conducted using barge-based pile driving equipment positioned at the work site with tug boats. The duration of pile driving would be one or two seasons, each approximately 6 months. Typically, up to three 36 inch piles, six 24 inch piles, or some combination of the two would be driven per day, with the duration of pile driving with the impact hammer to seat the piles into bedrock of about 15 minutes per pile.

Temporary Increases in Suspended Sediment

There would be no dredging or other disturbance of bottom habitat or open water habitat other than the minimal resuspension that would occur during driving of the piles for the new pier, access ramps, and fender piles.

The project site is strongly influenced by the tidal currents of Hudson River. As discussed above under “Water Quality,” any temporary increase in suspended sediment associated with pile driving would be localized and would dissipate shortly after the completion of the sediment disturbing activity. Tidal currents would dissipate any resuspended sediments such that redeposition within or outside the project area would not adversely affect benthic macroinvertebrates or bottom fish.

Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates generally are tolerant of elevated suspended sediment concentrations and have evolved behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions such as increases in suspended sediment and noise. Any sediment suspension during in-water work would be temporary, minimal, and localized, and would be well below physiological impact thresholds of adult and larval fish and benthic macroinvertebrates. Additionally, because fish are mobile and generally avoid unsuitable conditions in the field, such as large increases in suspended sediment and noise (Clarke and Wilber 2000), the effects of habitat avoidance would not significantly affect their condition, fitness, or survival. Fish also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. Mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans exposed to suspended sediments for up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000), which would not occur from the in-water work associated with the proposed project. Pile driving is an intermittent activity and would therefore have limited effect on suspended sediment concentrations within any given location during the duration of construction. As discussed in the FEIS for the Hudson River Park resuspension of bottom sediment during pile driving within the Hudson River Park would be temporary and of short duration.

Other Potential Impacts Associated with Pile Driving

Pile driving with impact hammers can generate underwater sound pressure waves that may adversely affect fish (CalTrans 2001, Longmuir and Lively 2001 in NOAA 2008). Because the proposed project would only require short periods of driving (i.e., about 45 to 90 minutes per day assuming 15 minutes per pile with typically up to three 36 inch piles or up to six 24 inch piles driven per day, or some combination of the two), these activities would not result in significant adverse impacts to fish within the lower Hudson River, even if occurring concurrently with pile driving conducted at Pier 57. At Pier 57, most of the piles to be installed are 18-inch diameter along the edge of the pier (250 piles). An additional 40 24 by 24 inch precast concrete piles will be installed for the bulkhead and perimeter walkway extensions. Because the piles for that project do not need as much weight bearing capacity as the proposed project, installation of piles would use a combination of allowing piles to sink deep into the sediment under their own self weight, and driving with an impact or vibratory hammer as needed. Pier 57 pile driving with an impact hammer would be minimized to the greatest extent possible, and would be at least 50 feet away from pile driving that would occur for the proposed project, with much of the pile driving for Pier 57 at least 100 feet away from the proposed project.

Should pile driving for the proposed project and Pier 57, or other in-water activities associated with the construction of the proposed project, cause fish to avoid portions of the Hudson River in the vicinity of the project site during the brief periods of pile driving for both projects, the extent of the area that would be affected at any one time would be small, when compared with the available suitable habitat that would still be available within the lower Hudson River. To further reduce the likelihood of impacts to the fish community, pile driving for Pier 57 and the proposed project would not occur during the November to April period when winter flounder and striped bass are found in higher densities within the New York Harbor than other months. Appendix C, "Analysis of the Potential for Underwater Noise to Adversely Affect Threatened or Endangered Species," presents a detailed analysis of the potential for underwater noise from pile driving to adversely affect Atlantic and shortnose sturgeon, and marine turtles.

Loss of Benthic Habitat

The installation of new piles would result in the permanent loss of approximately 2,502 square feet (0.06 acres) of benthic habitat and benthic macroinvertebrates located within the footprint of the piles that are unable to move from the area of disturbance.

The loss of benthic macroinvertebrates within the pile footprints would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish.

In summary, during construction of the in-water project elements and pile driving activities, the temporary and localized increases in suspended sediment and alterations to bottom habitat, benthic macroinvertebrates, and water column habitat would not result in any significant adverse impacts to aquatic biota of the Hudson River.

Operation

As discussed above under "Water Quality," the operation of Pier 54 would not result in significant adverse impacts to water quality, and, therefore, would not result in significant adverse impacts to fish or benthic macroinvertebrates. Some of the piles that would be installed as part of the proposed project may provide suitable refuge to fish, and the pile spacing that would result from the proposed project would not result in significant adverse effects to tidal movement and possible effect on water quality and aquatic habitat.

With the proposed project, approximately 84,300 square feet (1.94 acres) of pile field habitat would be established within the existing Pier 54 footprint, which would provide additional, structured habitat for fish species, such as striped bass, black sea bass, winter flounder, and marine invertebrates including marine worms (oligochaetes/polychaetes), amphipods, barnacles and other Crustacea, as well as increased abundance of primary producers due to the increased light exposure, such as phytoplankton and benthic microalgae. Pile fields have been found to be preferred habitat for diverse number of fish species in the Harbor Estuary (Able et al. 1998). Fish preferentially spend time in pile field and open water habitats compared to under pier habitats. Able et al. (1998) observed that young-of-year fish abundance and species richness were higher in pile field and open water habitats than under large piers in the lower Hudson River. Growth rates for fish were also found to be higher in pile field and open water habitats than in habitats found under large piers (Able, Manderson, and Studholme 1999). Juvenile fish have also been observed to spend more time near wrecks, pier fields, and open water than under piers (Duffy-Anderson, Manderson, and Able 2003). Therefore, the creation of this pile field would result in benefits to the fish community in the project and adjacent areas.

The proposed project would include nighttime lighting on top of the pier for event and general operation, and underpier architectural lighting of the "pots" that would support the pier. Nighttime artificial lighting has been found to both attract fish (e.g., Juell and Fosseidengen 2004, Marchesan et al. 2005, Martins and Perez 2006, McConnel et al. 2010) and cause fish to avoid lighted areas (Contor and Griffeth 1995, Van Aanholt et al. 1998, Schmidt et al. 2009), depending on the species of fish and the color, intensity, type, and duration of the light. The avoidance of artificial lighting by some species and attraction of others in turn affects fish community composition, feeding behavior (Mazur and Beauchamp 2006), schooling behavior (Johansson et al. 2006), migratory movement patterns (Tabor et al. 2001, Riley et al. 2013), and predator-prey dynamics (Scheuerell and Schindler 2003, Becker et al. 2013). Artificial lighting has also been observed to impede spawning (Woodhead 1966) and increase stress hormones in some fish (Migaud et al. 2007).

The site of Pier 54 and the lower Hudson River in general is in a highly urbanized environment and subjected to extensive amounts of nighttime artificial lighting. Under existing conditions, the area of river around Pier 54 receives direct or indirect nighttime lighting from numerous sources including nearby buildings, street lights, and automobile headlights, in addition to light coming from similar sources across the river in New Jersey. The proposed project would use computerized lighting controls to minimize any incremental increase in lighting from the proposed project. These controls would:

- not allow direct beam from architectural lighting into the water;
- allow for lights to be turned off or dimmed periodically;
- automatically turn lights off when the pier is not in use;
- maintain a dark “rest” period every night; and
- use directional, shielded lighting that would minimize any spill beyond the pier.

With these measures in place the proposed project would not result in significant adverse impacts to aquatic habitat or aquatic biota within the study area due to nighttime lighting.

Shading

The new Pier 54 would consist of a 320 foot by 320 foot platform for an overall pier surface area of approximately 2.4 acres. To reach the new pier from the mainland, two access ramps would be constructed: the northern access ramp would have an overall surface area of approximately 0.1 acres, and the southern access ramp would have an overall surface area of approximately 0.2 acres. Compared to the No Action pier (1.9 acres) the construction of the new pier and access ramps would result in a net increase of overwater structure of approximately 0.8 acres. However, unlike the No Action pier that would be constructed immediately above the water surface, the proposed pier would be elevated above the water surface, introducing more sunlight under the pier than under the No Action condition, as discussed below.

NYSDEC usually considers aquatic habitat under an overwater structure to be shade-impacted beyond 15 feet inward from the structure’s edges. This is consistent with recent studies that found shading from Hudson River piers to affect the behavior and abundance of fishes under the pier, approximately 15 or more feet from the nearest pier edge (Able and Grouthues 2011, Able et al. 2013). Shading from piers in the Hudson River has also been found to influence fish community composition, feeding activity, and growth rates (e.g., Able and Duffy-Anderson 2006, Duffy-Anderson and Able 1999).

The two access ramps would be no wider than 28 feet and would not result in significant adverse impacts to aquatic habitat due to shading. Similarly, the up to 4,000-square-foot (0.09 acres) vessel moored in the vicinity of the amphitheater to provide additional support facilities during the 6-month performance season (representing the maximum vessel size and duration of mooring that would occur for the proposed project) would be separated from the mooring walkway by a distance of approximately 4 feet, and would allow light to penetrate below the vessel during the day. Therefore, the temporary mooring of the vessel would not result in significant adverse impacts to aquatic habitat due to shading. The increased elevation of the proposed project relative to the reconstructed Pier 54 in the No Action condition would result in fewer adverse effects on aquatic habitat from shading by overwater structures, when compared to the No Action pier. Unlike the No Action pier, which would be almost level with the water surface, as shown in **Figures C-3** through **C-22** in Attachment C, "Shadows," direct sunlight would reach under portions of the elevated proposed pier, particularly during early morning and late afternoon in all seasons when the sun is closer to the horizon, and for much of the day in winter when the arc of the sun is lower in the sky.

Using shade modeling software, which provides a conservative estimate of the extent and duration of shadows for existing and proposed structures, the area of the proposed pier and No Action pier that would receive only one hour or less of sunlight (i.e. the most shaded area modelled or "full-shade") was projected for the Spring/Fall (March 21/September 21), Summer (June 21), and Winter (December 21) equinoxes (see **Figures F-3** through **F-5**). These positions of the sun represent the intermediate, highest and lowest positions of the sun during the year, respectively. As indicated in **Figures F-3** through **F-5**, the proposed pier would result in substantially less shading of aquatic habitat (decrease of between 50 to 51 percent) than the No Action pier. Therefore, due to the proposed pier's higher and variable elevation above the water surface, the proposed project would realize a substantial improvement (reduction) in the quantity of Hudson River aquatic habitat in full shade. Areas of new shadow due to the rolling topography of the proposed project would move over the course of the day, not falling on one particular area for long. The current flows swiftly in the Hudson River and would move phytoplankton and other natural elements quickly through the shaded areas. The areas of the river that would receive the longest durations of new shadows would continue to receive ample sunlight in the midday and afternoon, because there are no intervening structures to the west. Therefore, given their limited duration and extent, incremental shadows generated by the proposed project would not have significant adverse impacts on primary productivity within the Hudson River.

The 1998 FEIS for the overall Hudson River Park determined that the park would not result in a net increase in platform area over water. The 0.8-acre increase in overwater coverage resulting from the proposed project would be within the amount of overwater coverage authorized by the USACE and NYSDEC permits for this segment of the Hudson River Park.

In summary, the operation of the redeveloped pier would not result in significant adverse impacts to aquatic biota of the Hudson River.

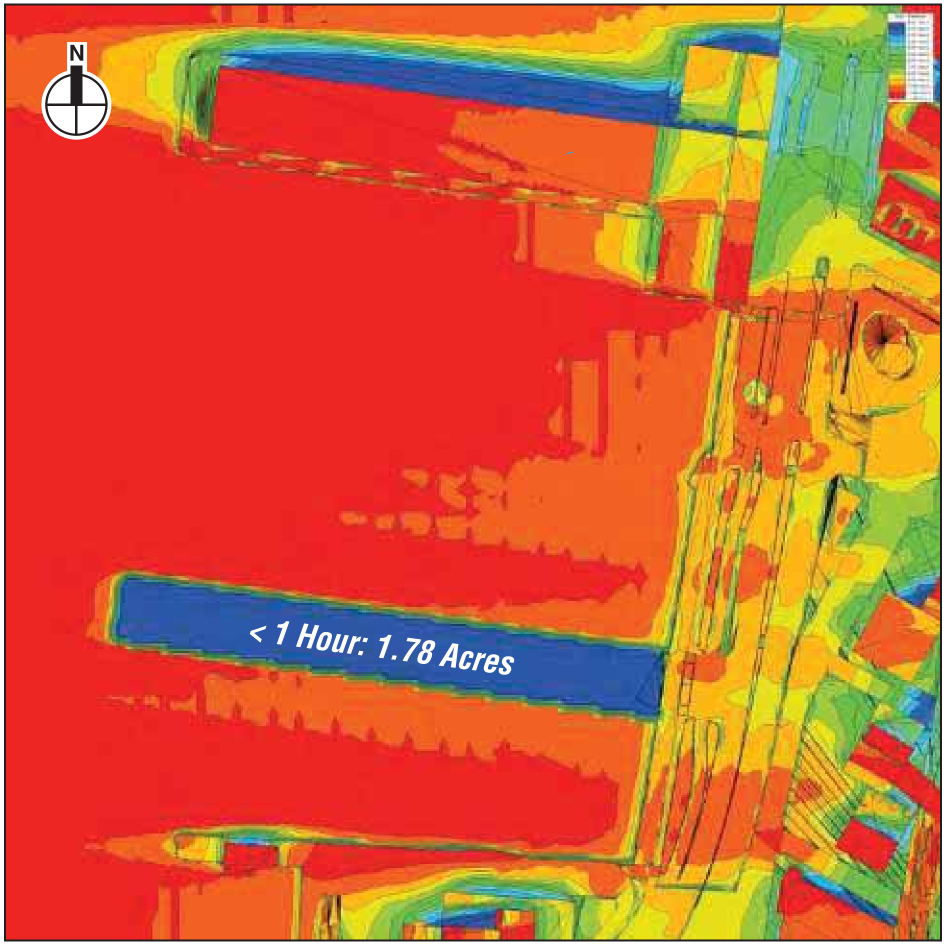
ESSENTIAL FISH HABITAT

For the reasons identified above, and described in detail in the EFH assessment included in Appendix D, the proposed project would not result in significant adverse impacts to water quality, aquatic habitat, or aquatic biota. Therefore, the proposed project would not result in significant adverse impacts to the suitability of the project site for fish species identified by NMFS as having EFH in the lower Hudson River Estuary.

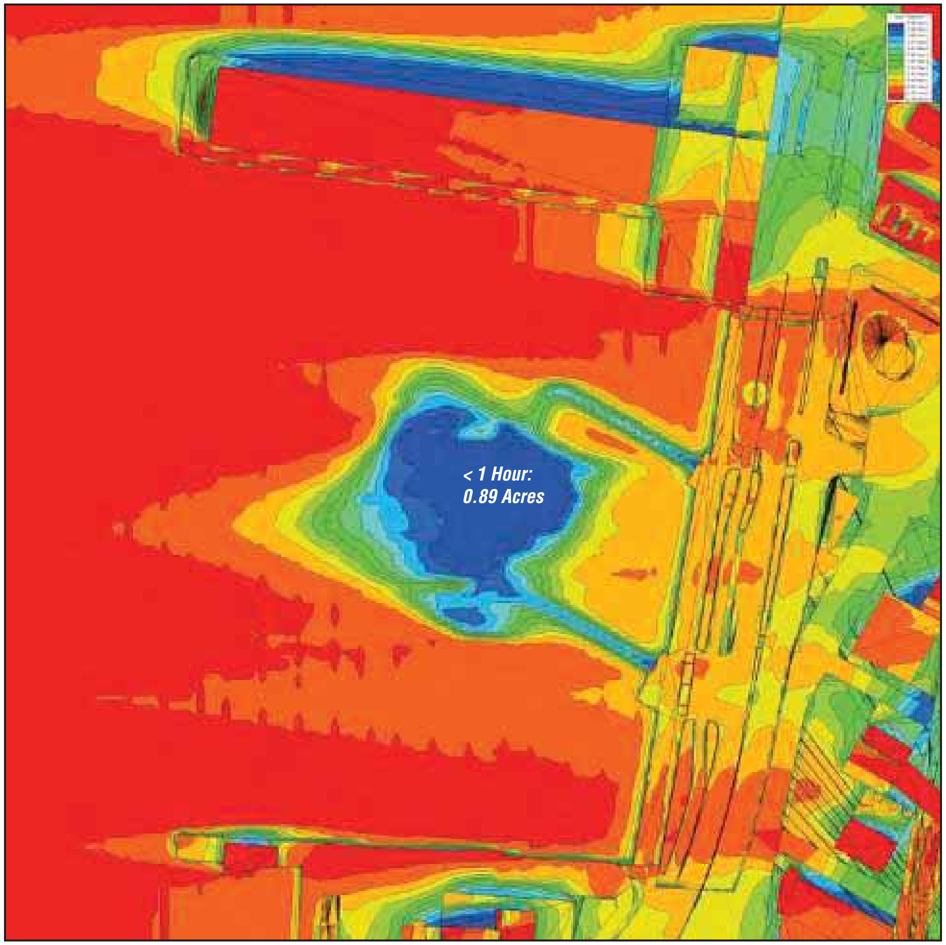
THREATENED OR ENDANGERED SPECIES, OR SPECIAL CONCERN SPECIES

Because shortnose and Atlantic sturgeon are more likely to occur in deep water habitat of the Hudson River in the vicinity of the project site during migration to and from upriver foraging, overwintering, and/or spawning grounds, it is unlikely that individuals of either species would occur in the vicinity of the proposed project except perhaps as occasional transients. Because the water quality impacts associated with the proposed project's in-water construction activities and pile driving would be localized, the deep channel habitat typically used by shortnose and Atlantic sturgeon would not be adversely impacted during construction of the proposed project. Migration of Atlantic sturgeon into the Hudson River during spring and migration from the river

2.4.15



No Action Condition



With Action Condition

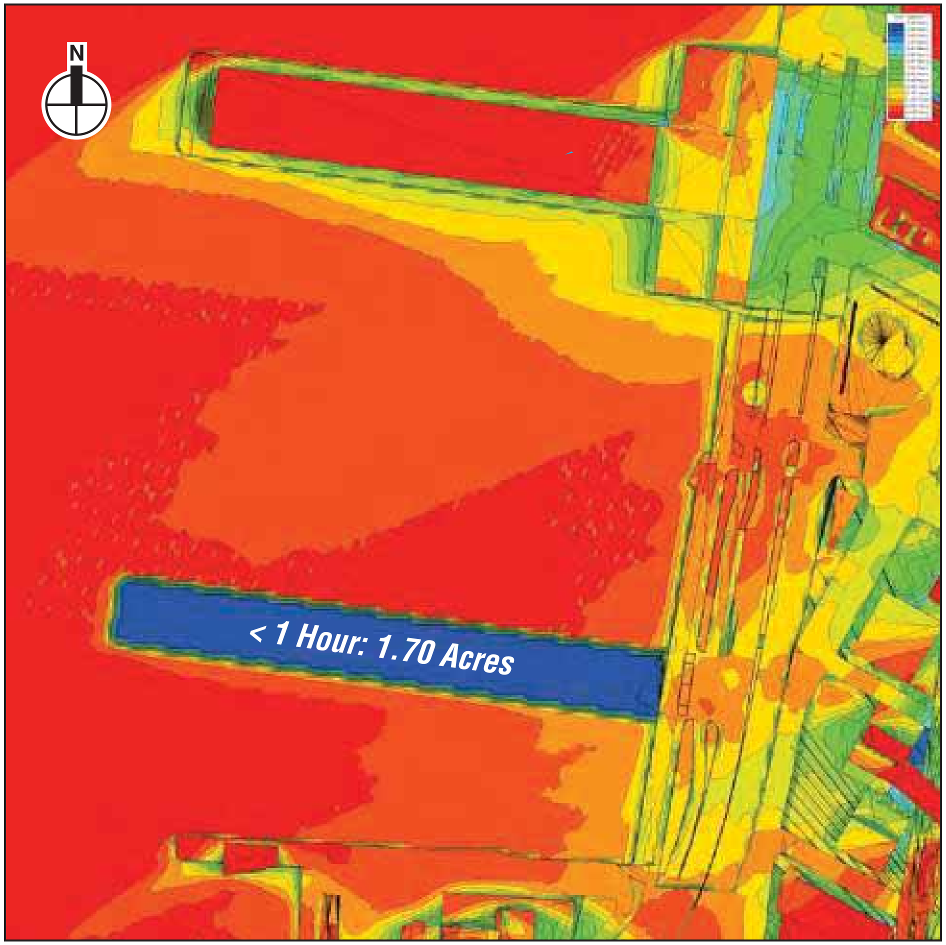
Solar: Exposure

- 0.00 Hours
- 1.00 Hours
- 2.00 Hours
- 3.00 Hours
- 4.00 Hours
- 5.00 Hours
- 6.00 Hours
- 7.00 Hours
- 8.00 Hours
- 9.00 Hours
- 10.00 Hours
- 11.00 Hours
- 11.98 Hours

Note: Acreage measurements are approximate.

March 21 / September 21

Figure F-3



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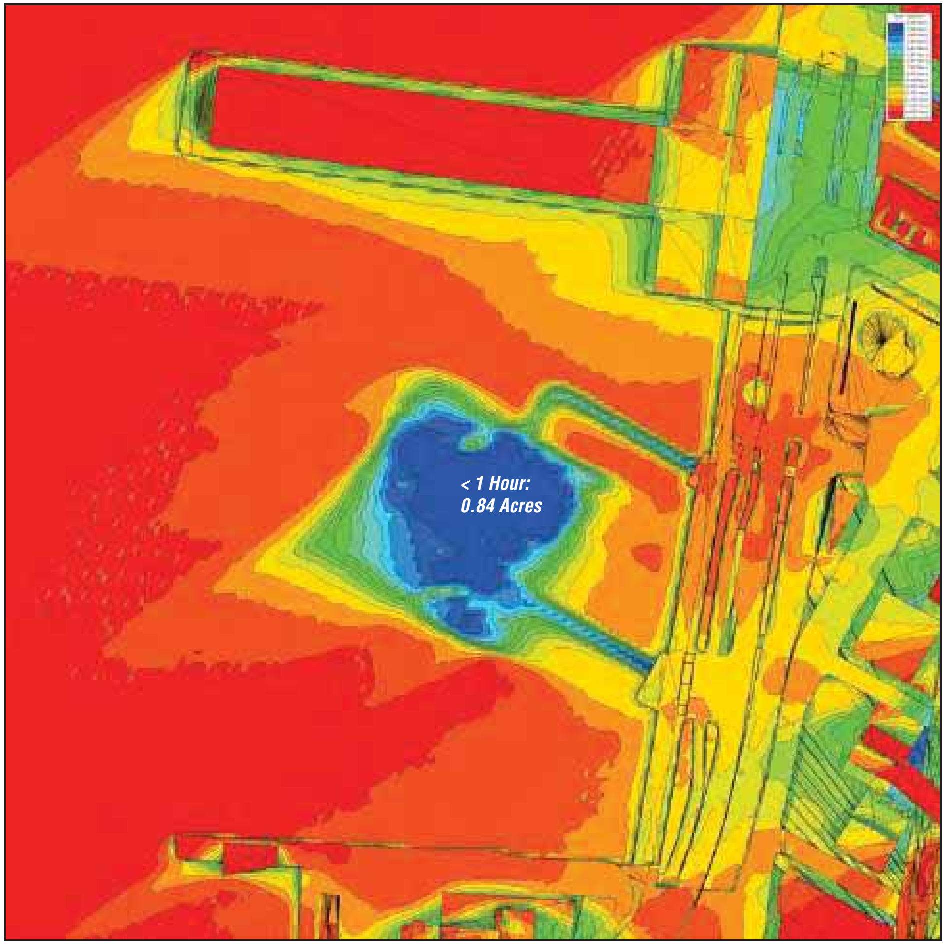
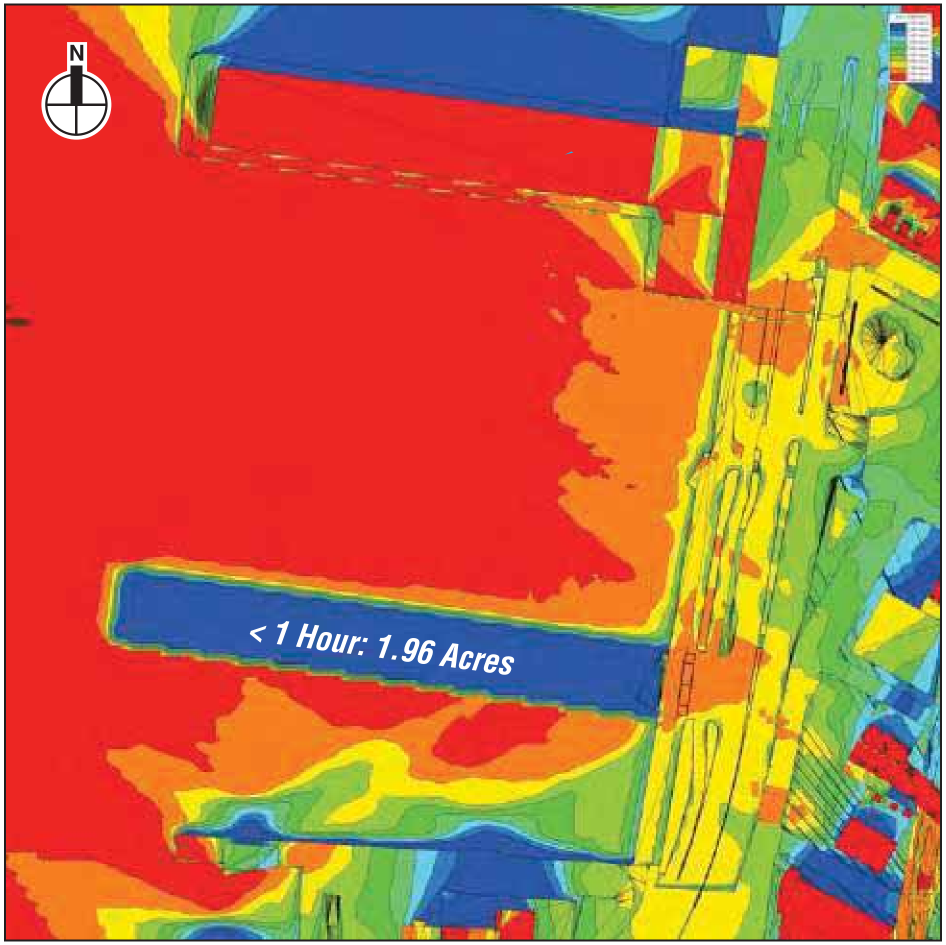


With Action Condition

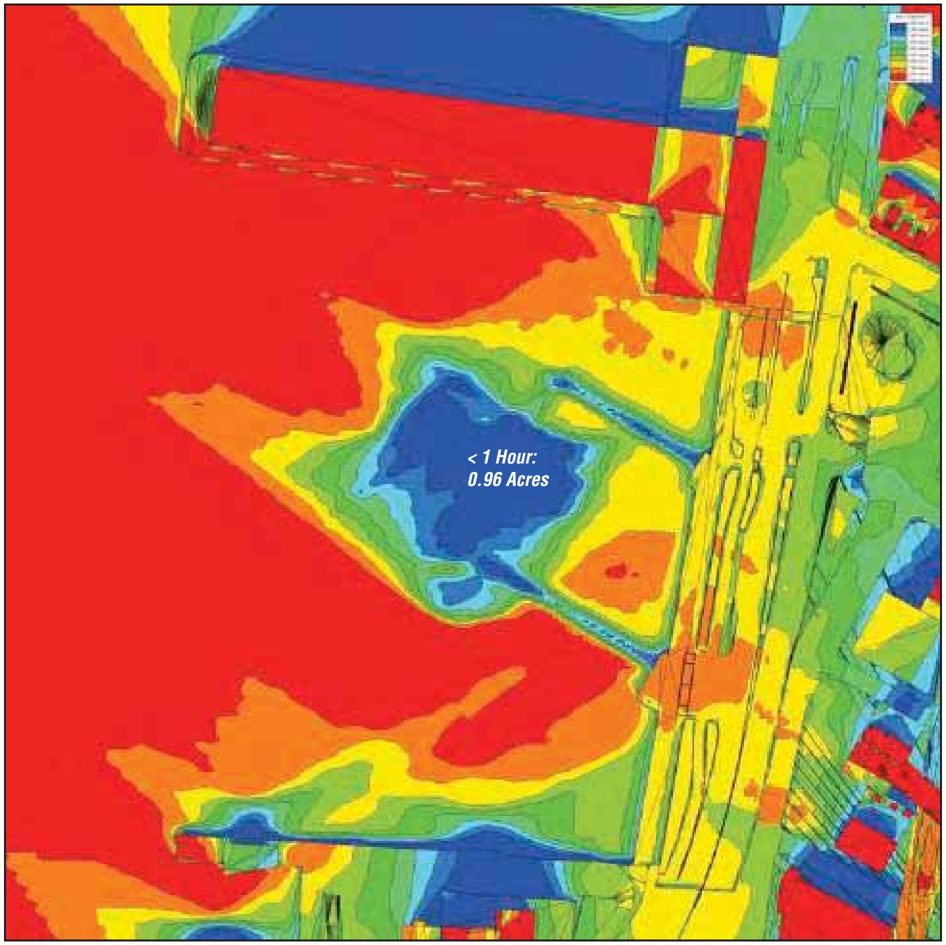
Note: Acreage measurements are approximate.

June 21

Figure F-4



No Action Condition



With Action Condition

Note: Acreage measurements are approximate.

December 21

Figure F-5

during the summer/early fall months would not be obstructed by pile driving activities which are planned from May 1 through October 31, and would not be adversely affected by the additional activities that may be involved with in-water construction activities outside this period that would occur for the installation of the concrete sleeves for the concrete encased steel piles. Because the New York Harbor estuary is used primarily for migration rather than extended occupation for feeding or reproduction, it is unlikely that construction would significantly affect Atlantic sturgeon. Furthermore, although shortnose sturgeon were collected from the Hudson River channel south of the George Washington Bridge during winter sampling of the channel in 2003-2004 and 2004-2005, the number collected were relatively low, and all but two of the individuals were collected north of Pier 54. Additionally, these collections of shortnose sturgeon occurred during the November to April period, when pile driving and removal is prohibited to protect overwintering striped bass.

NMFS (2014) has identified certain levels of underwater noise that are believed to cause injury or behavioral disturbance to sturgeon. To minimize exposure of sturgeon to these noise levels, NMFS recommends measures including pile tapping[1] and use of wooden cushion blocks (see Appendix A). These measures would be implemented for the proposed project. Because the proposed project would only require short periods of impact pile driving to seat the pile into bedrock (i.e., approximately 90 minutes per day), the daily duration of elevated underwater noise exceeding those levels associated with injury is relatively short, even when considered with the minimal effects associated with concurrent pile driving at Pier 57. Appendix C provides a detailed analysis of the potential for underwater noise from pile driving for the proposed project to result in significant adverse impacts to Atlantic and shortnose sturgeon and marine turtles. The results of that analysis demonstrate that underwater noise levels exceeding those associated with injury would not affect the deeper water habitats of the navigation channel (located more than 200 feet from pile driving) that sturgeon most commonly inhabit within the Hudson River. Similarly, underwater noise levels associated with behavioral avoidance of sturgeon will be minimized through the use of a wooden cushion block as recommended by NMFS, and would not obstruct movement of migrating sturgeon past the project. In conclusion, the proposed project may affect but is unlikely to adversely affect shortnose and Atlantic sturgeon, and there will not be an incidental take for Atlantic or shortnose sturgeon as a result of impact pile driving for the proposed project.

Pier 57, where a pair of peregrine falcons once nested, is approximately 400 feet north of the project site for the proposed project. While construction and operation of the proposed project would not result in significant adverse impacts to peregrine falcon, should peregrines return to Pier 57.

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

The Lower Hudson Reach has been identified as a Significant Coastal Fish and Wildlife Habitat primarily because of its use by large numbers of juvenile striped bass as wintering habitat. Adult striped bass enter the Hudson River to spawn during spring and summer but spend most of their time in coastal waters, not within the study area for the project. Spawning occurs in freshwaters far upstream of the study area and would not be adversely affected by the construction or

[1] Pile tapping (i.e. a series of minimal energy strikes) for an initial period to cause fish to move from the immediate area.

operation of Pier 54. Because striped bass spawning occurs well upriver of Pier 54, the majority of the larval striped bass are also located upstream of the study area. Furthermore, the highest abundance of juvenile striped bass is also upstream of the study area, nearly 90 miles north. Because striped bass larvae and juveniles are widely distributed throughout the Hudson River, losses of individuals resulting from the construction of the project would not result in adverse impacts to striped bass populations of the Hudson River. Due to the restriction of pile driving between November 1 and April 30 when juveniles are using the area for wintering habitat, the limited potential for in-water construction activities and operation of the pier to affect water quality, and the limited potential for pile driving to result in significant adverse impacts to fish, the proposed project would not result in significant adverse impacts to striped bass or adversely affect the designation of this portion of the Hudson River as a Significant Coastal Fish and Wildlife Habitat.

TERRESTRIAL RESOURCES

CONSTRUCTION

Construction of the proposed project would not result in significant adverse impact on terrestrial resources. The nearest significant green space and quality habitat available to native wildlife is the Hallett Nature Sanctuary at Central Park’s southern end, more than two miles north of Pier 54. Construction of the proposed project would have no impact on wildlife inhabiting this area. Smaller green spaces within the vicinity of the project (less than a half mile away) with the potential to provide wildlife habitat include the 14th Street Park (located immediately across Route 9A from the project site), Clement Clarke Moore Park (located northeast of the project site at Tenth Avenue and West 22nd Street), Jackson Square (located southeast of the project site at Eighth Avenue and Horatio Street), and the Chelsea Waterside sections of Hudson River Park (located north of the project site at West 23rd Street and Eleventh Avenue). The wildlife with the potential to use the habitats provided by these green spaces and open lawn with shade trees would be those tolerant of urban conditions and would not be adversely affected by the proposed project. The proposed project would also have no significant short- or long-term impacts on the disturbance-tolerant wildlife inhabiting the area immediately surrounding Pier 54.

OPERATION

Plant materials will be selected for their suitability for the anticipated conditions which include salinity from salt spray, winds, solar exposure and human use. Plants within the vicinity of where wave action can be anticipated to create spray will be selected for salt tolerance. Plant types include coastal trees, shrubs and grasses such as *Pinus rigida*, *Rosa virginiana*, *Myrica pensylvanica*, *Panicum virgatum* and *Solidago sempervirens*. Plant types for higher, more exposed elevations include *Cedrus atlantica*, *Cedrus libani*, *Zelkova serrata*, *Hamamelis* var., and *Juniperus* var. Maintenance access routes will be provided throughout the park such that routine care can be undertaken. Plant selection, spacing and distribution will be such that a normal standard of care is anticipated. Plant spacing for ground covers will be such that within 3 months of planting on slopes greater than 1:3, root systems and foliage will cover 90 percent of exposed soil. Tree massing would contribute to lowering wind velocity and providing shade within the park for greater comfort to visitors. This green landscaping of the pier would benefit insect pollinators such as butterflies and bees, and migratory and resident birds.

Soils would be manufactured using locally available sand and compost to achieve a well-drained, stable medium that is resistant to compaction and erosion. Soil fertility would be maintained through periodic replenishment of compost. Slope stabilization would be accomplished through a variety of strategies based on slope angle and anticipated foot traffic. On slopes up to 30 degrees, stabilization would rely on plant roots and mulch. On slopes between greater than 30 degrees, soils would be stabilized through a combination of geofibers (or non-degradable mesh) and densely rooted shrubs and ground covers. Irrigation within turf areas will use spray heads while irrigation within steep slopes and shrub/ground cover areas would utilize a drip system. The landscape and turf would be maintained using Integrated Pest Management techniques, thereby eliminating use of pesticides.

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A. INTRODUCTION

This attachment assesses the potential for the proposed project to result in significant adverse noise impacts. The analysis determines whether the proposed project would result in increases in noise levels that could have a significant adverse impact on nearby sensitive receptors and also considers the effect of existing noise levels at the project site on proposed uses. The proposed project would not generate sufficient traffic to have the potential to cause a significant noise impact (i.e., it would not result in a doubling of Noise passenger car equivalents [Noise PCEs] which would be necessary to cause a 3 dBA increase in noise levels). However, the attachment does evaluate the degree to which noise generated by peak events on the proposed pier would have the potential to result in elevated noise levels at nearby receptors and whether ambient noise levels adjacent to the project site would meet City Environmental Quality Review (CEQR) noise level guidelines for open space. These considerations are presented below.

PRINCIPAL CONCLUSIONS

The analysis concludes that noise levels in the newly created Pier 54 open space would be greater than the 55 dBA $L_{10(1)}$ prescribed by *CEQR Technical Manual* noise exposure guidelines, but would be comparable to other parks around New York City. During most of the time, when peak events are not occurring at the main space, the proposed project would result in no increase in noise levels at nearby noise receptors. However, the proposed new Pier 54 would host some events with amplified sound, including some events with up to 5,000 attendees (the "peak event") at the main space. The incremental change in noise levels during such peak events as compared to the noise levels during a peak event at the rebuilt Pier 54 in its existing location (i.e., the No Action condition) is not predicted to exceed the *CEQR Technical Manual* criteria for a significant impact at any of the analysis receptors. The proposed project would not result in any significant adverse noise impacts.

B. ACOUSTICAL FUNDAMENTALS

Sound is a fluctuation in air pressure. Sound pressure levels are measured in units called "decibels" ("dB"). The particular character of the sound that we hear (a whistle compared with a French horn, for example) is determined by the speed, or "frequency," at which the air pressure fluctuates, or "oscillates." Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as 1 Hertz ("Hz"). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernable and therefore more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

"A"-WEIGHTED SOUND LEVEL (DBA)

In order to establish a uniform noise measurement that simulates people's perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or "dBA," and it is the descriptor of noise levels most often used for community noise. As shown in **Table G-1**, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library, for example) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA would be considered noisy, and then loud, intrusive, and deafening as the scale approaches 130 dBA.

Table G-1
Common Noise Levels

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	80–90
Busy city street, loud shout	80
Busy traffic intersection	70–80
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas, or residential areas close to industry	50–60
Background noise in an office	50
Suburban areas with medium-density transportation	40–50
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0

Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.
Sources: Cowan, James P. *Handbook of Environmental Acoustics,* Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of 10 dBA describes a doubling of perceived loudness. Thus, the background noise in an office, at 50 dBA, is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, it must be at least 3 dBA. At 5 dBA, the change will be readily noticeable.

EFFECTS OF DISTANCE ON SOUND

Sound varies with distance. For example, highway traffic 50 feet away from a receptor (such as a person listening to the noise) typically produces sound levels of approximately 70 dBA. The same highway noise measures 66 dBA at a distance of 100 feet, assuming soft ground conditions. This decrease is known as "drop-off." The outdoor drop-off rate for line sources, such as traffic, is a decrease of approximately 4.5 dBA (for soft ground) for every doubling of distance between the noise source and receiver (for hard ground the outdoor drop-off rate is 3 dBA for line sources). Assuming soft ground, for point sources such as amplified rock music the outdoor drop-off rate is a decrease of approximately 7.5 dBA for every doubling of distance between the noise source and receiver (for hard ground the outdoor drop-off rate is 6 dBA for point sources).

SOUND LEVEL DESCRIPTORS

Because the sound pressure level unit of dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise that fluctuates over extended periods have been developed. One way is to describe the fluctuating sound heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted by $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are used to indicate noise levels that are exceeded 1, 10, 50, 90, and x percent of the time, respectively.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}.

For purposes of the proposed project, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in this noise impact evaluation. $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and construction noise impact evaluation, and is used to provide an indication of highest expected sound levels. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines for City environmental impact review classification.

C. NOISE STANDARDS AND CRITERIA

NEW YORK CEQR NOISE CRITERIA

The *CEQR Technical Manual* sets external noise exposure standards; these standards are shown in **Table G-2**. Noise exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The noise level specified for outdoor areas requiring serenity and quiet is 55 dBA $L_{10(1h)}$.

IMPACT DEFINITION

The determination of significant adverse noise impacts in this analysis is informed by the use of both absolute noise level limits and relative impact criteria. The *CEQR Technical Manual* states that "it is reasonable to consider 65 dBA $L_{eq(1)}$ as an absolute noise level that should not be significantly exceeded." Therefore, the determination of impacts first considers whether a projected noise increase would result in noise levels exceeding 65 dBA $L_{eq(1)}$. Where appropriate, this study also consults the following relative impact criteria to define a significant adverse noise impact, as recommended in the *CEQR Technical Manual*:

- If the No Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would be considered significant.

Table G-2
Noise Exposure Guidelines For Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	-------- $Ldn \leq 60$ dBA --------	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Hospital, nursing home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA	-------- $60 < Ldn \leq 65$ dBA --------	$65 < L_{10} \leq 80$ dBA	(i) $65 < Ldn \leq 70$ dBA, (II) $70 \leq Ldn$	$L_{10} > 80$ dBA	-------- $Ldn \leq 75$ dBA --------
Residence, residential hotel, or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient public health facility		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
Commercial or office		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:

(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more; (ii) *CEQR Technical Manual* noise criteria for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the L_{dn} value for such train noise to be an L^{y}_{dn} (L_{dn} contour) value.

Table Notes:

1. Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.
2. Tracts of land where serenity and quiet are extraordinarily important and serve an important public need, and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and nursing homes.
3. One may use FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.
4. External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Source: New York City Department of Environmental Protection (adopted policy 1983).

- If the No Action noise level is between 60 dBA $L_{eq(1)}$ and 62 dBA $L_{eq(1)}$, a resultant $L_{eq(1)}$ of 65 dBA or greater would be considered a significant increase.
- If the No Action noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$.

D. NOISE PREDICTION METHODOLOGY

The proposed new Pier 54 would include three distinct, unenclosed performance areas: the amphitheater, the southern lawn space, and the main space. Events associated with the amphitheater would be attended by 750 or fewer people, and events at the southern lawn space would be attended by 200 or fewer people. Events at these spaces, while they may include some sound amplification, would not be expected to result in sound levels that would cause a perceptible change in $L_{eq(1)}$ as measured at sensitive receptors. Peak events at the main space would be attended by up to 5,000 people and would likely include amplified sound. Noise generated by peak events in the main space on the proposed pier would have the potential to result in elevated noise levels at nearby receptors. The rebuilt Pier 54 in its existing location in the No Action condition would also include a performance space that would also have the potential to generate elevated noise levels at nearby receptors.

The analysis of peak events on the No Action pier and the proposed pier consisted of the following procedure:

- At noise sensitive locations near the site of the proposed new Pier 54, existing noise levels were measured during various time periods when events may take place;
- A reference noise level during peak events of 93 dB(A) at 80 feet was specified for the main space during peak events based on historical noise level data from comparable events in Hudson River Park;
- Noise levels due to the event space in the No Action condition (i.e., on the rebuilt Pier 54 in its existing location) were calculated at the nearby noise sensitive locations by combining the measured existing non-event noise levels with event-generated noise level based on the reference event noise level projected to the receptor location;
- Noise levels due to a peak event in the main space in the With Action condition (i.e., on the proposed Pier 54) were calculated at the nearby noise sensitive locations by combining the measured existing non-event noise levels with the event-generated noise level based on the reference event noise level projected to the receptor location; and
- Calculated peak event-related noise levels in the No Action and With-Action conditions were compared for purposes of impact determination.

While Pier 57 to the north of the proposed new Pier 54 would also host some events with amplified sound, HRPT will ensure that there would not be overlapping events at both Pier 54 and Pier 57. This requirement would be implemented through the maintenance and observance of a master schedule. Therefore, the combined noise from overlapping events on both piers was not considered.

MOBILE SOURCE AND MECHANICAL EQUIPMENT NOISE

A detailed mobile source noise analysis is not required because the proposed project would not generate sufficient traffic to have the potential to cause a significant noise impact. Additionally, the proposed project would not include any permanent mechanical systems (e.g., ventilation systems). Therefore no further analysis of these sources is required, and the proposed project would not result in significant adverse impacts due to mobile source or mechanical equipment noise.

E. EXISTING NOISE LEVELS

Existing noise levels were measured at two (2) locations near the project site (see **Figure G-1**). **Table G-3** lists the receptor site locations and their representative uses. All receptors were used to evaluate potential noise impacts due to a peak event in the proposed main space. These receptors were selected as the locations with a noise sensitive use in closest proximity to the main event space. As described above, sound levels decrease with distance from the source, and sensitive receptors, including residences, at greater distance from the speaker system included in the main space would experience any potential noise associated with the proposed project at a lower level, and would consequently be less likely to experience significant noise increases as a result of the proposed project The two receptor locations shown in **Table G-3** are each less than 500 feet away from the main event space of the proposed project, whereas the nearest residence is located at 521 West Street, over 800 feet away from the main event space. These receptors,

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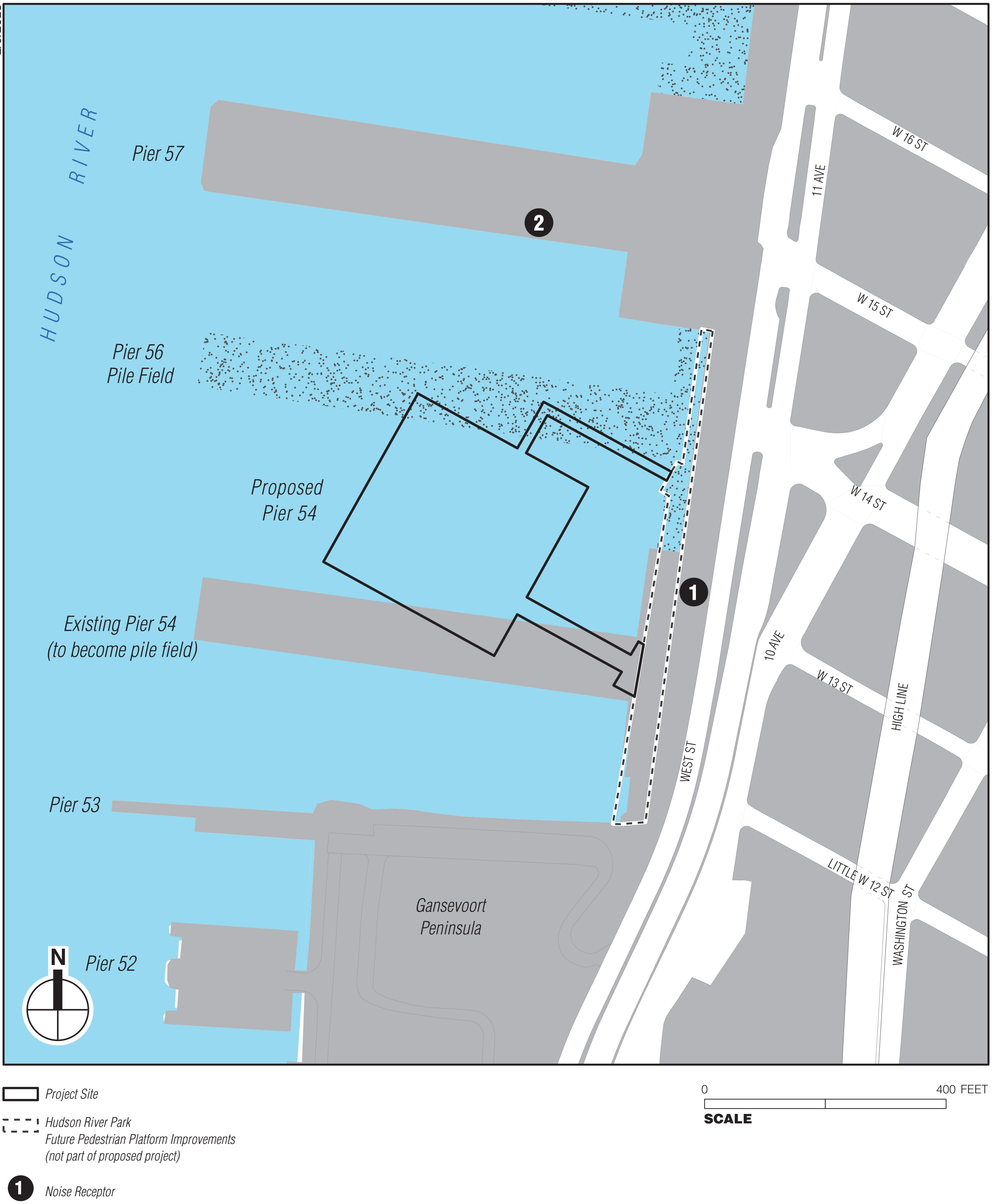

Noise Receptor Locations

Figure G-1

due to their proximity to the project site, represent the nearby sensitive noise receptors with the greatest potential to experience significant noise increases as a result of the proposed project.

Table G-3
Noise Receptor Locations

Receptor	Location	Representation
1	Hudson River Esplanade at West 13th Street	Project Site and Hudson River Park Waterfront Esplanade
2	Roof of Pier 57	Planned Open Space

At all receptor sites, existing noise levels were measured for 20-minute periods during two weekday periods—PM (5:00 to 7:00 PM) and Event (8:00 PM to 9:30 PM)—as well as one Saturday period—Event (8:00 PM to 9:00 PM). The PM time period represents the normal evening commuter period and the Event time period represents the time when events would be most likely to be occurring on the proposed pier. Measurements were taken on April 2, 9, 12, and 26, 2014.

EQUIPMENT USED DURING NOISE MONITORING

Measurements were performed using Brüel & Kjær Sound Level Meters (SLMs) Type 2260, 2250, and 2270, Brüel & Kjær ½-inch microphones Type 4189, and Brüel & Kjær Sound Level Calibrators Type 4231. The SLMs have laboratory calibration dates within one year of use, as is standard practice. The Brüel & Kjær SLMs are Type 1 instruments according to ANSI Standard S1.4-1983 (R2006). For all receptor sites the instrument/microphone was mounted on a tripod at a height of approximately 5 feet above the ground surface. Microphones were mounted at least approximately 5 feet away from any large reflecting surfaces. The SLMs were calibrated before and after readings with Brüel & Kjær Type 4231 Sound Level Calibrators using the appropriate adaptor. Measurements at each location were made in dBA. The data were digitally recorded by the sound level meters and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, L_{90}, and 1/3 octave band levels. A windscreen was used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

RESULTS

The results of the existing noise level measurements are summarized in **Table G-4**.

Table G-4
Existing Noise Levels (in dBA)

Site	Measurement Location	Time		L_{eq}	L_1	L_{10}	L_{50}	L_{90}
1	Hudson River Esplanade West 13th Street	Weekday	PM	71.2	76.1	73.5	71.5	60.6
			Event	72.5	77.3	75.7	72.4	58.6
		Saturday	Event	70.2	74.9	73.3	70.6	55.1
2	Roof of Pier 57	Weekday	PM	65.6	73.3	67.9	64.0	60.7
			Event	61.7	72.0	62.6	58.5	56.0
		Saturday	Event	58.3	65.3	60.3	57.7	52.9
Note: Field measurements performed by AKRF, Inc. on April 2, 9, 12, and 26, 2014.								

At all measurement locations, during the measurement time periods, vehicular traffic noise on adjacent roadways was the dominant noise source. Measured levels were moderate to relatively high and reflect the level of vehicular activity on the adjacent streets. In terms of the CEQR criteria, the existing noise levels at receptor 1 would be in the “marginally unacceptable” category and the existing noise levels at receptor 2 would be in the “marginally acceptable” category.

F. FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the proposed project, or No Action condition, noise levels at and adjacent to the project site would be comparable to those in the existing conditions, except during events which would be held at the rebuilt Pier 54 at its existing location. As discussed in Attachment A, “Project Description and Environmental Screenings,” in the No Action condition the existing Pier 54 would be rebuilt in accordance with the authorizations received from the New York State Department of Environmental Conservation (NYSDEC) and United States Army Corps of Engineers (USACE) in 2005, and would resume general park and event uses, consistent with its prior functions. The rebuilt pier would host peak events of a similar size and type as the proposed project with comparable amplification, and would have a similar capacity of approximately 5,000 attendees. The frequency of peak events would be similar in both the No Action and With Action conditions. Consistent with the prior configuration of the stage on Pier 54 at past events, when peak events would occur on the rebuilt Pier 54 in the No Action condition, in order to allow the 5,000 attendees to egress safely, the stage would typically be located at the west end of the pier, and the sound system would face east towards the audience, as well as towards open space and residential locations on land. The width of the No Action pier would not be sufficient to allow safe egress of 5,000 attendees from both sides of the stage if it were positioned at the east end of the pier. Based on these factors, and the methodology described above, noise levels resulting from events at the rebuilt Pier 54 in its existing condition were calculated at each of the noise receptor locations. The No Action condition event noise levels are shown in **Table G-5**.

Table G-5
Noise Levels During Event in No Action Condition (in dBA)

Site	Time		Existing $L_{eq(1)}$	Projected Event-Generated $L_{eq(1)}$ at 80 Feet	Distance to Event Space (feet)	Noise Attenuation due to Distance (assuming a 6 dB decrease per doubling of distance)	Noise Attenuation due to Directivity[1]	Event-Generated $L_{eq(1)}$ at Receptor	Total No-Action $L_{eq(1)}$ at Receptor
	Weekday	PM	71.2						75.4
		Event	72.5						76.0
1	Saturday	Event	70.2		765	-19.6	0.0	73.4	75.1
	Weekday	PM	65.6						65.9
		Event	61.7						62.5
2	Saturday	Event	58.3	93.0	745	-19.4	-18.9	54.7	59.9

Note:
1. This analysis accounts for the directivity of noise from the events on the pier. As discussed above, the event space on the rebuilt Pier 54 in its existing location would be located on the western portion of the rebuilt pier and would be used for the events generating the noise analyzed in this assessment. Within the space, the stage and speakers would face toward the east and therefore receptors to the north would experience some attenuation of sound levels due to the noise source being directed away from them.

In terms of CEQR noise exposure guidelines, future noise levels in the No Action condition during a peak event at receptor 1 would remain in the “marginally unacceptable” category and future noise levels at receptor 2 would remain in the “marginally acceptable” category.

G. PROBABLE IMPACTS OF THE PROPOSED PROJECT

NOISE DUE TO PROPOSED PIER PROGRAMMING

The main space on the proposed new Pier 54 would be located on the northeastern portion of the proposed new Pier and the location of the proposed new Pier 54 would be further north than the location of the existing Pier 54 and the rebuilt Pier 54 in the No Action condition. As a result, the main space on the proposed new Pier 54 would be closer to both the noise receptor locations representing the Hudson River Park waterfront esplanade and the Pier 57 rooftop open space. However, the speakers associated with the main space of the proposed new Pier 54 would face toward the southwest, away from the analyzed noise receptors. Both of these factors (i.e., distance to the receptors, directionality relative to the receptors) would affect the event-generated noise levels at both receptors in the future with the proposed project as compared to the No Action condition. The effects of the topography of the proposed new Pier 54 would not have an appreciable effect on noise transmission from the main space to the analyzed receptor locations, because the main space is located at a relatively high elevation on the proposed new Pier 54, and as a result, the topography does not shield the surrounding areas. Further, the proposed new Pier 54 would be landscaped and the resulting surfaces would be relatively absorptive, which would preclude the topography from resulting in substantial reflected noise at the surrounding areas.

Using the methodology previously described, future noise levels during a peak event in the main space on the proposed new Pier 54 were calculated for the receptor sites. As noted above, the existing open space area at receptor 1 and the planned open space area at receptor 2 would have the greatest potential to experience significant adverse noise impacts as a result of peak events. Receptors located further away would experience lower noise levels due to the project. The predicted noise levels are presented in **Table G-6**.

Table G-6
Predicted Noise Levels Due to Peak Event at Proposed Main Space (in dBA)

Site	Time		No Action $L_{eq(1)}$ During Main Space Event	Projected Event-Generated $L_{eq(1)}$ at 80 Feet	Distance to Event Space (feet)	Noise Attenuation due to Distance (assuming a 6 dB decrease per doubling of distance)	Noise Attenuation due to Directivity[1]	Event-Generated $L_{eq(1)}$ at Receptor	Total Build $L_{eq(1)}$ at Receptor	Noise Level Increment	Total Build $L_{10(1)}$ at Receptor
1	Weekday	PM	75.4	93.0	225	-9.0	-25.7	58.4	71.4	-4.0	73.7
		Event	76.0						72.7	-3.3	75.9
	Saturday	Event	75.1						70.5	-4.6	73.6
2	Weekday	PM	65.9		430	-14.6	-18.9	59.5	66.6	0.6	68.9
		Event	62.5						63.8	1.3	64.7
	Saturday	Event	59.9						62.0	2.1	64.0

Note:
1. This analysis accounts for the directivity of noise from the events on the proposed Pier 54. As discussed in Attachment A, “Project Description and Environmental Analysis,” the main space would be located on the northeastern portion of the redeveloped pier and would be used for the events generating the noise analyzed in this assessment. Within the main space, the stage and speakers would face toward the southwest and therefore receptors to the east would experience some attenuation of sound levels due to the noise source being directed away from them.

In terms of CEQR noise exposure guidelines, future noise levels during a peak event in the main space at receptor 1 would remain in the "marginally unacceptable" category and future noise levels at receptor 2 would remain in the "marginally acceptable" category.

At receptor 1, representing the Hudson River Park waterfront esplanade, noise levels during a peak event in the main space would be less with the proposed new Pier 54 as compared with the renovated Pier 54 in its existing location. This is because, even though the main space would be closer to the receptor with the proposed new Pier 54, the speakers associated with the main space would face away from the receptor, as opposed to facing toward it as they would with the event space on the renovated Pier 54 in the No Action condition. The speakers facing away from the receptor results in substantially lower noise levels at the receptor.

At receptor 2, the increase in $L_{eq(1)}$ noise levels during a peak event in the main space of the proposed new Pier 54 as compared to the noise levels during a peak event at the rebuilt Pier 54 in its existing location (i.e., the No Action condition) would be 2.1 dBA or less, which would be barely perceptible, and well below the 5 dBA criterion for a significant impact based upon CEQR criteria.

Additionally, the noise levels shown in the analysis above would only occur during certain events (i.e., peak events with amplified sound and up to 5,000 attendees) at the redeveloped Pier 54 main space. At all other times, including when events would be held in the amphitheater or at the southern lawn space, noise levels would be considerably lower than those shown above. The noise level increases resulting from the proposed project would not result in any significant adverse noise impacts.

H. NOISE LEVELS AT OPEN SPACE AREAS

The new open space areas created on site as part of the proposed project would experience a range of noise levels at various locations, with higher levels closer to Route 9A and lower levels closer to the Hudson River. The former is the dominant source of noise in this area and at the project site. The portion of the proposed open spaces associated with the proposed project that would experience the greatest noise levels would be represented by receptor site 1, and would therefore be expected to experience $L_{10(1)}$ values up to 75.9 dBA. This exceeds the 55 dBA $L_{10(1)}$ noise level guideline for outdoor areas requiring serenity and quiet provided in the *CEQR Technical Manual* noise exposure guidelines (see **Table G-2**). There are no practical and feasible measures that could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline within the open space areas. Although noise levels in these areas would be above the 55 dBA $L_{10(1)}$ guideline noise level, they would be comparable to typical noise levels in Hudson River Park, and noise levels in a number of open space areas that are also located adjacent to heavily trafficked roadways, including Brooklyn Bridge Park, the High Line, Riverside Park, Bryant Park, and Fort Greene Park. The 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet; however, due to the level of activity present at most New York City open space areas and parks (except for areas far away from traffic and other typical urban activities) this relatively low noise level is often not achieved. The same circumstance would occur with the No Action condition and, accordingly, there would not be any significant adverse environmental impact. ✷

A. INTRODUCTION

As discussed in Attachment A, "Project Description and Environmental Analysis," the proposed project would involve the construction of a new public park pier just to the north of the existing Pier 54 and creating a pile field at the existing Pier 54 footprint. This attachment to the Environmental Assessment Form (EAF) summarizes the construction program for the proposed project and assesses the potential for adverse impacts during construction activities. The anticipated construction schedule for the proposed project is described, followed by a description of the types of activities likely to occur during the redevelopment of Pier 54. The types of construction equipment are also discussed, along with the expected number of workers and truck deliveries. Based on this information, an assessment of potential impacts from construction activity is conducted.

PRINCIPAL CONCLUSIONS

Although there would be localized, temporary disruptions due to construction activity, as is the case with any construction activity, this analysis finds that the proposed project would not result in any significant adverse impacts due to construction activities. This finding is based on an analysis of the types of construction activities and their intensity, the location of sensitive receptors that could be affected by the proposed project's construction, and the overall construction duration. While the project would entail pile driving, unlike typical ground-up construction, the proposed project would not involve building demolition, excavation, or superstructure construction activities, which often generate the highest levels of noise and air emissions. Furthermore, there are few sensitive receptors locations near the project site. Specifically, other than Hudson River Park, the project site is located at some distance away from sensitive receptor locations and is separated from such receptors by Route 9A. The nearest sensitive receptor other than Hudson River Park is the Liberty Inn, located at a distance of approximately 220 feet northeast of the project site. The nearest residence is 521 West Street, located at a distance of approximately 650 feet southeast of the project site.

B. OVERVIEW OF CONSTRUCTION ACTIVITIES

INTRODUCTION

This section first describes the City, State, and Federal regulations and policies that govern construction activities, followed by an overview of the anticipated construction phasing and schedule of the proposed project and general construction practices, including those associated with deliveries, access, and hours of work. Finally, a description of each type of construction activity is provided.

GOVERNMENTAL COORDINATION AND OVERSIGHT

Construction oversight involves several City, State, and Federal agencies. **Table H-1** lists the primary involved agencies and their areas of responsibility. The New York City Department of Buildings (DOB) enforces safety regulations to protect both the workers and the general public during construction. The New York City Department of Environmental Protection (DEP) enforces the *New York City Noise Code*. The New York City Fire Department (FDNY) has primary oversight of compliance with the *New York City Fire Code.*

Table H-1
Construction Oversight in New York City

Agency	Areas of Responsibility
New York City	
Department of Buildings	Oversight for site safety
Department of Environmental Protection	Noise
Fire Department	Compliance with Fire Code
New York State	
Department of Transportation	Route 9A lane narrowing and/or closures
Department of Environmental Conservation	Hazardous materials
Office of Parks, Recreation, and Historic Preservation	Archaeological and architectural protection
Hudson River Park Trust	Site access and staging
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials
Occupational Safety and Health Administration	Worker safety

At the State level, the New York State Department of Transportation (NYSDOT) reviews and approves any Route 9A traffic lane narrowing and/or closures. The New York State Department of Conservation (NYSDEC) regulates disposal of hazardous materials. The New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) approves the historic and cultural resources analysis, the Construction Protection Plan (CPP), and monitoring measures established to prevent damage to historic structures, as needed.

At the Federal level, although the United States Environmental Protection Agency (USEPA) has wide-ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons, much of its responsibility is delegated to the state level. The Occupational Safety and Health Administration (OSHA) sets standards for work-site safety and construction equipment.

In addition to the above oversight, the Hudson River Park Trust (HRPT), consistent with the conditions of the NYSDEC and United States Army Corps of Engineers (USACE) permits issued for the development of Hudson River Park, prohibits in-water pile-driving in the park between November 1 and April 30. As with other construction activity in Hudson River Park, HRPT will designate appropriate staging areas and require installation of public safety measures around the construction site.

CONSTRUCTION PHASING AND SCHEDULE

Table H-2 shows the anticipated construction schedule for the proposed project. Independent of the proposed project, HRPT will be removing the deteriorated deck of the existing Pier 54 as previously authorized. Piles at that location would be retained as a pile field. Project construction on the new pier would proceed in three primary stages: pile installation; structural deck construction; and park finishes. These construction stages are described in greater detail below in "General Construction Tasks." As shown in the table, the proposed project would be completed over an approximately 37-month period. It is anticipated that construction would begin in May 2016 with pile installation activities. All pile installation activities associated with the construction of the proposed project would be completed within two pile-driving seasons (May 1 to October 31 in 2016 and 2017); in-water pile-driving activities are prohibited from November through April. Structural deck construction would commence in November 2016 and is anticipated to take up to approximately 19 months to complete. Park finishing, including landscaping and utility work, is anticipated to start in May 2017 and would take approximately 25 months to complete. Based on this schedule, it is expected that the redeveloped Pier 54 would be complete and operational in 2019.

Table H-2
Anticipated Construction Schedule

Construction Task	Anticipated Schedule	Approximate Duration (months)
Pile Installation	May 2016–October 2016; May 2017–October 2017[1]	6/6 -12 total
Structural Deck Construction	November 2016–June 2018	up to 19
Park Finishes (includes landscaping, utilities, etc.)	May 2017–June 2019	25

Notes:
[1]All pile-driving activities associated with the construction of the proposed project would be completed within two pile-driving seasons (May 1 to October 31); in-water pile-driving activities are prohibited from November through April.
Source: HRPT, November 2014.

GENERAL CONSTRUCTION PRACTICES

Consistent with other Hudson River Park construction projects, HRPT would work with the community and elected officials to keep them apprised of ongoing construction and to be available to address concerns. In addition, New York City maintains a 24-hour telephone hotline (311) so that concerns can be registered with the City.

STAGING AREAS AND DELIVERIES

Access to the construction site would be controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. Security guards and flaggers would be posted as necessary. The flaggers could be supplied by the subcontractor on-site at that time or by the construction manager. The flaggers would control trucks entering and exiting the site under standards established by HRPT and NYSDOT to ensure the safety of pedestrians and vehicles passing through the area. In addition, they would provide assistance to traffic circulation as the trucks enter and exit the on-street traffic streams. For pile installation and structural deck construction, materials would be delivered to the project site primarily through barges; for park finishes, materials would be delivered to the project site via truck.

Consistent with construction of other public park piers, marine contractors would not require land staging areas other than a small space for an office trailer. The staging and laydown of materials for pile installation and structural deck construction would be done primarily from barges. Contractors during the park finishes task would stage on the Hudson River pedestrian platform located adjacent to the reconstructed Pier 54.

HOURS OF WORK

Construction activities for the proposed project would be carried out in accordance with New York City laws and regulations, which allow construction activities to take place between 7:00 AM and 6:00 PM. Construction work would typically begin at 7:00 AM on weekdays, with most workers arriving between 6:00 AM and 7:00 AM. Normally, work would end at 3:30 PM. Necessary permits would be obtained from the appropriate agencies if work is required outside of normal construction hours (i.e., weekend and after-hour work). No work outside of normal construction hours could be performed until such permits are obtained.

ESPLANADE AND BIKEWAY NARROWING

During construction of the proposed project, as has occurred during construction of other sections of Hudson River Park, the Hudson River Park waterfront esplanade immediately adjacent to the project site would need to be closed for periods of time, but pedestrian and cycling access would be maintained. Pedestrians would be diverted to a shared bikeway and pedestrian path to maintain safe pedestrian movement through the area. Any esplanade and bikeway narrowing or diversion would be coordinated with and approved by HRPT and NYSDOT.

RODENT CONTROL

During construction, the contractor would carry out a rodent (mouse and rat) control program, as necessary. Signage would be posted, and coordination would be conducted with appropriate public agencies. Only USEPA- and NYSDEC-registered rodenticides would be utilized, and the contractor would be required to perform rodent control program in a manner that is not hazardous to the general public, domestic animals, and non-target wildlife.

GENERAL CONSTRUCTION TASKS

The first construction task would be initial site preparation. Field office trailers for the construction engineers and managers would be hauled to the site and installed and several moveable barges would be brought to the project site to serve as equipment and material staging areas. These activities would also involve the installation of public safety measures such as construction safety signs. Construction startup tasks are normally completed within days.

Construction of the proposed project would then commence and would involve three main stages—pile installation, structural deck construction, and park finishes—each of which is described below.

PILE INSTALLATION

Pile installation activities would occur within two pile-driving seasons (between May and October in 2016 and 2017), to be completed outside of the November 1 to April 30 window in which pile driving is prohibited by the USACE and NYSDEC permits for Hudson River Park. The piles would be driven to bedrock with an impact hammer. In-water pile driving for the proposed project would be conducted using barge-based pile driving equipment positioned at the project site using tug boats. The redeveloped Pier 54 platform and access ramps would be supported on new piles installed in the river. The piles would consist of hollow concrete. **Figure A-12** shows a preliminary pile layout plan for the proposed project. Pile driving is anticipated to take about 15 minutes per pile, with typically up to three 36 inch piles or up to six 24 inch piles driven per day, or some combination of the two. A detailed description of the pile design options and installation activities is provided in Attachment F, “Natural Resources.”

To finish pile driving within two six-month seasons, there would be up to three barge-based construction crews (approximately 42 workers) on site. Each crew would have an approximately 60-by-180-foot crane barge and a material barge of the same size. It is anticipated that the barges would typically move every few days, as the crane barges would be positioned to create the best lifting angles and shortest lifting distances.

STRUCTURAL DECK CONSTRUCTION

After pile installation activities are substantially complete, structural deck construction would begin. Similar to the pile installation task, there would be three crews (approximately 42 workers) on site for structural deck construction. One crew would erect the modular units of the pier (e.g., the pots) onto the installed piles with the use of barge-cranes while the second crew would construct the access ramps to the reconstructed pier. The modular units would create the pier platform surface onto which the proposed park space would be installed. Structural deck construction would commence after pile installation activities and would take up to approximately 19 months to complete.

PARK FINISHES

Park finishes activities would commence in 2017 and would include landscaping, wall and railing installation, utilities work, and paving. Equipment used during park finishes would include backhoes and mini excavators. Park finishes activities would take place from land, with all deliveries, equipment, and material being trucked to the project site. Approximately 21 workers would be employed for this task, and approximately 6 to 15 truck deliveries would be expected per day. The trucks would enter the project site via a Route 9A curb cut opposite the Pier 54 south entrance ramp. Park finishes would take approximately 25 months to complete.

SUMMARY OF NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

As discussed above in “General Construction Tasks,” limited construction workers and deliveries would be required for the construction of the proposed project.

The estimated number of daily construction workers on site would vary between approximately 21 and 42, depending on the stage of construction, as follows:

- Pile installation: up to approximately 42 workers.
- Structural deck construction: up to approximately 42 workers.
- Park finishes: approximately 21 workers.

The estimated trucks per day would be as follows:

- Pile installation except for certain equipment deliveries most mobilization activities would be conducted via water.
- Structural deck construction: approximately 15 truck deliveries per day except for days with concrete pours which would have approximately 30 truck deliveries per day.
- Park finishes: approximately 6 to 15 truck deliveries per day.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the No Action condition, the existing Pier 54 structure would be reconstructed in accordance with the authorizations received from NYSDEC and USACE in 2008. In this scenario, the reconstruction of Pier 54 will require many of the same construction activities that would occur during construction of the proposed project. Reconstruction of the pier would incorporate the historic elements from the White Star Line, including the iron arch.

Other construction activities will occur near the project site in the No Action condition; in particular, the Pier 54 Connector project will result in improvements to the pedestrian platform, Route 9A bikeway, and landscaping in the vicinity of Pier 54.

D. PROBABLE IMPACTS OF THE PROPOSED PROJECT

Construction of the proposed project, as is the case with any construction activities, may be disruptive to the surrounding area. However, other than nearby portions of Hudson River Park, which consists primarily of an esplanade with limited seating areas adjacent to the project site and Pier 57, the project site is located at some distance away from sensitive receptor locations and is separated from such receptors by Route 9A. The nearest sensitive receptor other than Hudson River Park is the Liberty Inn, located at a distance of approximately 220 feet northeast of the project site. The nearest residence is 521 West Street, located at a distance of approximately 650 feet southeast of the project site. While the project would entail pile driving—unlike typical ground-up construction—it would not involve building demolition, excavation, or superstructure construction activities, which often generate the highest levels of noise and air emissions.

As discussed in Attachment B, "Land Use, Zoning, and Public Policy," the Pier 57 project and the Pier 54 Connector Project are located near the project site and are expected to be built prior to the completion of the proposed project, although some finish work on the Pier 54 Connector would occur after substantial completion of the Project to avoid damaging pavers with construction vehicles. . It is possible that construction of the proposed project could overlap with construction of these nearby projects. However, based on preliminary construction schedules, peak construction activities (e.g., those activities that generate the most traffic, noise, and/or air emissions) for the proposed project are not expected to overlap with those for the Pier 54 Connector and Pier 57 projects. For example, pile driving activities (typically the most noise intrusive construction work) associated with the Pier 54 Connector and the Pier 57 projects are expected to precede those associated with the proposed project, and thus would not result in overlapping noisy construction activities. Even if the peak construction activities for the proposed project overlap with those for the Pier 54 Connector and the Pier 57 projects, based on the distances between the Pier 54 and Pier 57 project sites, the difference in the level of construction-generated noise at any nearby receptor locations would be less than 3dBA, compared to construction of the proposed project by itself. The nearest residential receptor locations are over 550 feet away from either project site, and based on the decrease in noise level with distance, the levels of construction noise at these receptors would not be expected to exceed the *CEQR Technical Manual* impact criteria, even during peak overlapping construction activities. The level of construction noise within the Hudson River Park immediately adjacent to the project sites would be greater but existing noise levels within the park in these areas are also greater because of the proximity to Route 9A. Consequently, exceedances of CEQR Technical Manual noise impact criteria would also not be expected within the park. Further, at Pier 57, most of the piles to be installed are 18-inch diameter along the edge of the pier (250 piles) with an additional 40 24 by 24 inch precast concrete piles will be installed for the bulkhead and perimeter walkway extensions. The pile driving activities at Pier 57 are expected to utilize vibratory hammers rather than impact hammers to the greatest extent possible**.** In general, vibratory hammers produce less intrusive noise levels than impact hammers (vibratory hammers produce continuous noise versus impulsive noise from an impact hammer). Furthermore, neither the proposed project nor the Pier 54 Connector or Pier 57 projects would involve extensive building demolition, excavation, or superstructure construction activities, or subsurface disturbance, which can generate the highest levels of air and dust emissions.

Limited construction workers and deliveries would be required for the construction of the proposed project. As discussed in detail below under “Transportation,” the traffic increase due to construction activities for the proposed project would be minimal and well below the *CEQR Technical Manual* transportation analysis thresholds. Therefore, the limited number of construction workers and deliveries with the proposed project would not substantively affect any traffic increases due to the construction of the Pier 54 Connector and Pier 57 projects. In general, construction managers for projects on adjacent sites would coordinate their activities to avoid delays and inefficiencies. Any esplanade and bikeway narrowing or diversion due to the construction of these projects would be coordinated with and approved by HRPT and NYSDOT.

The following analysis describes the overall temporary effects of the proposed project’s construction activities on transportation, air quality, noise, land use and public policy, socioeconomic conditions, community facilities, open space, historic and cultural resources, natural resources, and hazardous materials.

TRANSPORTATION

The construction transportation analysis assesses the potential for construction activities to result in significant adverse impacts to traffic, parking conditions, and transit and pedestrian facilities. The analysis is based on the peak worker and truck trips during construction of the proposed project, which are developed based on several factors including worker modal splits, vehicle occupancy and trip distribution, truck passenger car equivalents (PCEs), and arrival/departure patterns. For the proposed project, the combined peak-construction, worker-vehicle and truck-trip generation would occur during structural deck construction activities; the greatest construction-related parking, transit, and pedestrian demand would occur during pile installation and structural deck construction activities.

The following sections evaluate the potential for the proposed project’s peak construction worker and truck trips to result in significant adverse impacts to traffic, parking, transit facilities, and pedestrian facilities.

TRAFFIC

An evaluation of construction sequencing and worker/truck projections was undertaken to assess potential traffic impacts.

Construction Trip-Generation Projections

The average worker and truck trip projections discussed above in “Number of Construction and Materials Deliveries,” were further refined to account for worker modal splits and vehicle occupancy, arrival and departure distribution, and truck PCEs.

Daily Workforce and Truck Deliveries

For a reasonable worst-case analysis of potential transportation-related impacts during construction, the daily workforce and truck trip projections in the peak quarter were used as the basis for estimating peak-hour construction trips. It is expected that construction activities would generate the highest amount of daily traffic during structural deck construction activities, with a peak of approximately 42 workers and 30 truck deliveries per day. These estimates of construction activities are discussed further below.

Construction Worker Modal Splits and Vehicle Occupancy

Based on the latest available U.S. Census data (2000 Census data) for workers in the construction and excavation industry, it is anticipated that 43 percent of construction workers would commute to the project site by private autos at an average occupancy of approximately 1.16 persons per vehicle.

Peak-Hour, Construction-Worker Vehicle and Truck Trips

Similar to other construction projects in New York City, most of the construction activities at the project site are expected to take place from 7:00 AM to 3:30 PM. While construction truck trips would occur throughout the day (with more trips during the early morning), and most trucks would remain in the area for short durations, construction workers would commute during the hours before and after the work shift. For analysis purposes, each truck delivery was assumed to result in two truck trips during the same hour (one “in” and one “out”), whereas each worker vehicle was assumed to arrive near the work shift start hour and depart near the work shift end hour. Further, in accordance with the *City Environmental Quality Review (CEQR) Technical Manual*, the traffic analysis assumed that each truck has a PCE of 2.

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and conventional arrival/departure patterns for construction workers and trucks. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips would take place during the hour before and after each work shift (6:00 to 7:00 AM for arrival and 3:00 to 4:00 PM for departure on a regular day shift). Construction truck deliveries typically peak during the hour before each shift (25 percent), overlapping with construction worker arrival traffic. Based on these projections, the maximum construction-related traffic increments would be approximately 42 PCEs between 6:00 AM and 7:00 AM and 12 PCEs between 3:00 PM and 4:00 PM. These incremental construction vehicle trips would be well below the *CEQR Technical Manual* 50 vehicle-trip-analysis threshold. Therefore, the traffic increase due to construction activities for the proposed project would not result in significant adverse impacts.

PARKING

As described above, the peak number of workers would be 42 per day, and would occur during pile installation and structure deck construction activities. And based on the latest available U.S. Census data (2000 Census data) for workers in the construction and excavation industry, it is anticipated that 43 percent of construction workers would commute to the project site by private autos at an average occupancy of approximately 1.16 persons per vehicle. The anticipated construction activities are therefore projected to generate a maximum parking demand of only 16 parking spaces. Construction workers are expected to park in off-street spaces or nearby parking facilities and the demand of 16 parking spaces could be fully accommodated by the off-street spaces and parking facilities available within a ¼-mile radius of the project site. Therefore, the proposed project would not result in any significant adverse parking impacts during construction.

TRANSIT

Based on the 2000 U.S. Census data for workers in the construction and excavation industry, it is anticipated that approximately 57 percent of construction workers would commute to the project site via transit. The study area is served by several mass transit lines, including four subway lines (the A, C, E, and L) and three bus routes (the M11, M14A, and M14D). During the peak-construction worker shift (maximum of 42 average daily construction workers in the 7:00 AM to 3:30 PM shift during pile installation and structural deck construction activities), approximately 24 workers would travel by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the estimated number of peak-hour transit trips would be 19, well below the *CEQR Technical Manual* 200-transit-trip analysis threshold. Therefore, the proposed project would not result in any significant adverse construction transit impacts, and no further analysis is required.

PEDESTRIANS

As summarized above, up to 42 average daily construction workers are projected in the 7:00 AM to 3:00 PM shift during peak construction. With 80 percent of these workers arriving or departing during the construction peak hours (6:00 AM to 7:00 AM and 3:00 PM to 4:00 PM), the corresponding numbers of peak-hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be approximately 34. This number is well below the *CEQR Technical Manual* 200-pedestrian-trip analysis threshold for detailed analysis. Therefore, construction of the proposed project would not result in any significant adverse pedestrian impacts, and no further analysis is required.

AIR QUALITY

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating construction activities, have the potential to affect air quality. In general, much of the heavy equipment used in construction has diesel-powered engines and produces relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Fugitive dust generated by construction activities also contains particulate matter. Finally, gasoline engines produce relatively high levels of carbon monoxide (CO). As a result, the primary air pollutants of concern for construction activities include nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO.

Construction of the proposed project, as is the case with any construction activities, may be disruptive to the surrounding area, in particular, to nearby residential, commercial, and open space uses. However, while the project would entail pile driving, unlike typical ground-up construction, the proposed project would not involve building demolition, excavation, or superstructure construction activities, which often generate the highest levels of air emissions when multiple heavy-duty diesel engines are employed simultaneously. In addition, construction of the proposed project would not involve subsurface disturbance activities, which often generate the highest levels of dust emissions.

One of the most intense construction activities in terms of air emissions would be pile driving, but this task would be limited to approximately 12 months total (within two separate 6-month period pile-driving seasons). Furthermore, there are very few sensitive receptors near the project site. The area of Hudson River Park adjacent to the project site consists primarily of an esplanade and adjacent bikeway; users of the park in this area are typically passing through and therefore would not be exposed to construction activities for an extended period of time. Other than Hudson River Park, the project site is located at some distance away from sensitive receptor locations and is separated from such receptors by Route 9A. The nearest sensitive receptor other than Hudson River Park is the Liberty Inn, located at a distance of approximately 220 feet northeast of the project site. The nearest residence is 521 West Street, located at a distance of approximately 650 feet southeast of the project site. Such distances between the emissions sources and these sensitive locations would result in enhanced dispersion of pollutants; therefore, potential concentration increments from on-site construction sources at such locations would be reduced. Furthermore, as reported above under "Transportation," limited construction worker vehicles and deliveries would be required for the construction of the proposed project. Therefore, there would be limited air pollutant emissions related to construction vehicular traffic, and further mobile-source analysis is not required. Moreover, to reduce pollutant emissions during construction, ultra-low sulfur diesel (ULSD) would be used exclusively for all diesel engines (including marine engines) throughout the construction site.

Based on the information presented above, the proposed project would not result in any significant adverse construction air quality impacts, and no further analysis is required.

NOISE

Impacts on noise levels during construction would include noise from the operation of construction equipment and noise from construction and delivery vehicles traveling to and from the site. Noise and vibration levels at a given location are dependent on the type and quantity of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Noise levels caused by construction activities would vary widely, depending on the stage of construction (e.g., pile installation or structural deck construction) and the location of the construction activities relative to noise-sensitive receptor locations. As noted above, there are very few noise sensitive receptors near the project site. Other than Hudson River Park, the project site is located at some distance away from sensitive receptor locations and is separated from such receptors by Route 9A. The nearest sensitive receptor other than Hudson River Park is the Liberty Inn, located at a distance of approximately 220 feet northeast of the project site. The nearest residence is 521 West Street, located at a distance of approximately 650 feet southeast of the project site. The area of Hudson River Park adjacent to the project site consists primarily of an esplanade and adjacent bikeway; users of the park in this area are typically passing through and therefore would not be exposed to construction activities for an extended period of time.

Typically, increased noise levels caused by construction activities can be expected to be greatest during the stages of construction where impact equipment (e.g., impact hammer on crane barge) would be employed. However, the duration of pile driving activities for the proposed project would be limited to approximately 12 months total (within two separate 6-month period pile-driving seasons). Because the bottom material is soft organic silt, driving the piles to bedrock is anticipated to be short, on the order of approximately 15 minutes per pile. The marine contractors are expected to pile drive for short periods of time per day (i.e., about 45 to 90 minutes), with the remaining time used for positioning the barges, installing the pile driving template, standing the piles off and cutting piles when seated into the bedrock; none of these related activities would generate significant noise levels. Aside from pile driving, a majority of the construction activities would involve structural deck construction in which modular units of the pier would be prefabricated off-site (thus limiting noise disruptions near the project site) and are brought to the site via barges before being placed onto the installed piles using barge cranes.

Construction noise is regulated by the requirements of the *New York City Noise Control Code* (also known as Chapter 24 of the Administrative Code of the City of New York, or Local Law 113), the DEP Notice of Adoption of Rules for Citywide Construction Noise Mitigation (also known as Chapter 28), and the USEPA's noise emission standards. These local and federal requirements mandate that specific construction equipment and motor vehicles meet specified noise emission standards; that construction activities be limited to weekdays between the hours of 7:00 AM and 6:00 PM; and that construction materials be handled and transported in such a manner as not to create unnecessary noise. As described above, for weekend and after hour work if necessary, permits would be required to be obtained, as specified in the *New York City Noise Control Code*. As part of the Code, a site-specific noise mitigation plan would be developed and implemented that may include source controls, path controls, and receiver controls.

In terms of source controls (i.e., reducing noise levels at the source or during most sensitive time periods), the following measures for construction would be implemented as required by the *New York City Noise Control Code*:

- The contractors would use equipment that meets the sound level standards specified in Subchapter 5 of the *New York City Noise Control Code*.
- As early in the construction period as practicable, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders and saws (i.e., early electrification) to the extent feasible and practicable.
- Where feasible and practicable, the construction site would be configured to minimize back-up alarm noise.
- Idling time would be limited to three minutes for all on-site equipment and vehicles that are not operating a loading, unloading, or processing device, or do not otherwise require idling for the proper operation of their engines.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

In terms of path controls (e.g., placement of equipment and implementation of barriers between equipment and sensitive receptors), the following measures for construction would be implemented as required by the New York City Noise Control Code:

- Where logistics allow, noisy equipment would be located away from sensitive receptor locations.
- Path noise control measures (e.g., portable noise barriers, panels, enclosures, and acoustical tents) would be used where feasible for certain dominant noise equipment to the extent feasible and practical (e.g., cranes and generators).

For impact determination purposes, significant adverse noise impacts are based on whether maximum predicted incremental noise levels at sensitive receptor locations off-site would be greater than the impact criteria suggested in the *CEQR Technical Manual* for more than two years. While the overall construction period for the proposed project is anticipated to be approximately 37 months the most noise-intensive construction activities (pile driving activities where impact equipment such as hoe rams and pile drivers would be employed) would last for only a portion for this duration, taking approximately 12 months total to complete (within two separate 6-month period pile-driving seasons), and would occur for approximately 45 to 90 minutes (15 minutes per pile, with typically up to three 36 inch piles or up to six 24 inch piles driven per day, or some combination of the two) on any given day of construction activity. While the project would entail pile driving, unlike typical ground-up construction, the proposed project would not involve building demolition, excavation, and superstructure construction activities, which would require simultaneous use of heavy construction equipment. While the proposed construction activities may be considered noisy and intrusive, potential increases in noise levels as a result of construction-related activities would therefore be of limited duration. In addition, construction activities are regulated by the requirements of the *New York City Noise Control Code*. Furthermore, there are very few noise sensitive receptors near the project. The nearest residences are located approximately 650 feet away. Due to distance and existing noise levels generated by traffic on Route 9A and the other factors described above, no significant adverse noise impacts would be expected due to the construction of the proposed project.

OTHER TECHNICAL AREAS

LAND USE AND NEIGHBORHOOD CHARACTER

As discussed in Attachment B, "Land Use, Zoning, and Public Policy" the project site is located within the Coastal Zone boundary of the City's Waterfront Revitalization Program (WRP). Construction of the proposed project would be consistent with Coastal Zone policies. Construction activities would affect land use on the project site but would not alter surrounding land uses. As is typical with construction projects, during periods of peak construction activity there would be some disruption, predominantly noise, to the nearby area. There would be construction trucks and construction workers coming to the project site. There would also be noise, sometimes intrusive, from construction work as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be temporary and would have limited effects on land uses within the study area, particularly as most construction activities would take place within the project site or within portions of sidewalks and curb lanes of streets immediately adjacent to the construction site. Overall, while construction activities at the project site would be evident to the local community, the limited duration of construction would not result in any significant or long-term adverse impacts on local land use patterns or the character of the nearby area.

SOCIOECONOMIC CONDITIONS

Construction activities associated with the proposed project would not result in any significant adverse impacts on socioeconomic conditions. Construction of the proposed project would not block or restrict access to any facilities in the area including the nearby Pier 57, affect the operations of any nearby businesses, or obstruct major thoroughfares used by customers or businesses. Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes.

COMMUNITY FACILITIES

As described above under “Transportation,” while construction of the proposed project would result in temporary increases in traffic during the construction period, these increases would be minor. Construction of the proposed project would not block or restrict access to and from any community facilities in the area, including the new Whitney Museum that is currently under construction east of the project site. Construction workers would not place any burden on public schools and would have minimal, if any, demand on libraries, child care facilities, and health care facilities. Construction activities would not materially affect the New York Police Department (NYPD), FDNY, or other emergency services or response times.

OPEN SPACE

The project site is located between the current Pier 54 footprint and the Pier 56 footprint to the north, within Hudson River Park at approximately West 13th Street. To the east of the pier is a paved area containing a portion of the Hudson River Park waterfront esplanade and the adjacent Route 9A bikeway. At limited times, activities such as pile installation may generate noise that could impair the enjoyment of nearby open space users, but such noise effects would be temporary. Furthermore, the area of Hudson River Park adjacent to the project site consists primarily of an esplanade and adjacent bikeway; users of the park in this area are typically passing through and therefore would not be exposed to construction activities for an extended period of time. During the course of construction, as has occurred during construction of other sections of Hudson River Park, the Hudson River Park waterfront esplanade immediately adjacent to the project site would need to be closed for periods of time, but pedestrian and cycling access would be maintained. Pedestrians would be diverted to a shared bikeway and pedestrian path to maintain safe pedestrian movement through the area. This disruption would be temporary and would not affect the overall use of Hudson River Park. Therefore, construction of the proposed project would not result in significant adverse impacts on open space.

HISTORIC AND CULTURAL RESOURCES

A detailed assessment of potential impacts on historic and cultural resources is described in Attachment D, “Historic and Cultural Resources.” The section below summarizes the potential for the proposed project to result in adverse construction-period impacts on historic and cultural resources.

As part of the *Hudson River Park Final Environmental Impact Statement (FEIS)* completed in 1998, archaeological studies were prepared for the area between the walkway adjacent to Route 9A and the U.S. Pierhead line. These studies concluded that there was no potential for significant pre-contact or historic-period archaeological resources in this area that includes the project site. Therefore, this assessment focuses on architectural resources only.

As the Pier 54 Connector Project will create a widened pedestrian walkway on a new bulkhead platform adjacent to the project site and construction of the access ramps to the new pier would not affect the S/NR-eligible bulkhead. The new access ramps would connect with the widened pedestrian platform, which would extend beyond the existing bulkhead line. However, if it is determined that the proposed project would affect the Hudson River bulkhead that work would be done in accordance with the Hudson River Park Section 106 Programmatic Agreement.

To avoid inadvertent construction-related impacts on the Hudson River Bulkhead, a construction protection plan would be prepared and implemented in consultation with OPRHP for the portions of the Hudson River bulkhead that are located within 90 feet of project construction, close enough to be inadvertently damaged by construction activities. The construction protection plan would include measures to ensure that the bulkhead is not affected by ground-borne construction vibrations or other potential construction-related issues. The construction protection would follow the guidelines established in section 523 of the *CEQR Technical Manual*, including conformance with the *New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark* and *Protection Programs for Landmark Buildings*. The construction protection plan would also comply with the procedures set forth in the DOB's *Technical Policy and Procedure Notice (TPPN) #10/88*, regarding procedures for the avoidance of damage to historic structures resulting from adjacent construction and which "requires a monitoring program to reduce the likelihood of construction damages to adjacent historic structures and to detect at an early stage the beginnings of damage so that construction procedures can be changed," and would also consider guidance provided in the National Park Service's *Preservation Tech Notes, Temporary Protection Number 3: Protecting a Historic Structure during Adjacent Construction*. Therefore, the proposed project is not anticipated to have any significant adverse impacts on the Hudson River bulkhead.

None of the architectural resources in the study area are close enough to the proposed project (within 90 feet) to experience direct, physical impacts from construction. Therefore, the proposed project would not result in any significant adverse construction-related impacts to historic and cultural resources.

NATURAL RESOURCES

The construction activities associated with the proposed project would not cause any significant adverse environmental impacts on terrestrial or aquatic resources, as discussed in Attachment F, "Natural Resources." Increases in suspended sediment resulting from construction activities would be temporary and localized and would be expected to dissipate quickly. Subadult and adult shortnose sturgeon and Atlantic sturgeon (federally-listed endangered species) are known to occur in the lower Hudson River in the vicinity of the proposed project, using this portion of the river as a migration corridor to and from foraging, overwintering, and/or spawning grounds. Sturgeon would be more likely to be present in the deeper water habitat of the navigation channel, which would not be affected by the proposed project, and would only occur in the interpier area in which the proposed project would be located as occasional transient individuals. Because the proposed project would only require short periods of driving with an impact hammer to seat the pile into bedrock (i.e., about 45 to 90 minutes per day), the extent of the area that would have the potential to result in an adverse physiological affect due to underwater noise at any one time is likely to be small, even when considered with the minimal effects associated with concurrent pile driving at Pier 57, and would not be expected to affect the deeper water habitats that the aquatic endangered shortnose and Atlantic sturgeon prefer within the Hudson River Channel (located more than 200 feet away from pile driving associated with the proposed project). Therefore, construction of the proposed project may affect, but is unlikely to adversely affect shortnose and Atlantic sturgeon. The prohibition of pile driving from November through April to protect overwintering striped bass would minimize potential impacts to striped bass and other fish overwintering within the vicinity of Pier 54. Seals and the four species of threatened or endangered sea turtles that may be present in the Harbor Estuary would only be expected to be present in the vicinity of Pier 54 as occasional transient individuals and would likewise not be significantly impacted by construction activities.

HAZARDOUS MATERIALS

As described in Attachment A, "Project Description and Environmental Analysis," as the proposed project would not involve hazardous subsurface disturbance of any upland areas, it would not have the potential to increase the exposure of people or the environment to hazardous materials. However, regulatory requirements associated with the disturbance of hazardous materials in or on existing buildings or structures (e.g., asbestos containing materials or lead-based paint) would be followed. Therefore, the proposed project would not result in any significant adverse impacts due to hazardous materials. ✷

Appendix A
Agency Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

May 05, 2014

Jim Nash
AKRF
34 South Broadway, Suite 401
White Plains, NY 10601

Re: Hudson River Park -- Pier 54 Redevelopment
Town/City: New York. County: New York.

Dear Jim Nash :

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Andrea Chaloux

Andrea Chaloux
Environmental Review Specialist
New York Natural Heritage Program

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The following state-listed animals have been documented at your project site, or in its vicinity.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing. The list may also include significant natural communities that can serve as habitat for Endangered or Threatened animals, and/or other rare animals and rare plants found at these habitats.

For information about potential impacts of your project on these populations, how to avoid, minimize, or mitigate any impacts, and any permit considerations, contact the Wildlife Manager or the Fisheries Manager at the NYSDEC Regional Office for the region where the project is located. A listing of Regional Offices is at http://www.dec.ny.gov/about/558.html.

The following species and habitats have been documented at or near the project site, generally within 0.5 mile. Potential onsite and offsite impacts from the project may need to be addressed.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	FEDERAL LISTING	
Birds				
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered		13472
Fish				
Shortnose Sturgeon *Freshwater*	*Acipenser brevirostrum*	Endangered	Endangered	1091

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at http://www.dec.ny.gov/animals/7494.html.

Information about many of the rare plants and animals, and natural community types, in New York are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NatureServe Explorer at http://www.natureserve.org/explorer.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

APR 29 2014

James Nash
Technical Director
AKRF
440 Park Avenue South
7th Floor
New York, NY 10016

Re: Hudson River Park – Pier 54, New York, NY

Dear Mr. Nash:

We received your letter on April 21, 2014 requesting information on the presence of species listed by us under the Endangered Species Act in the vicinity of a proposed construction of a public access pier to replace the existing Pier 54 on the Hudson River, immediately west of West 13th Street, New York City, NY.

At this point in the Hudson River, endangered shortnose sturgeon (*Acipenser brevirostrum*) and the endangered New York Bight, Chesapeake Bay, Carolina, and South Atlantic Distinct Population Segments (DPS) of Atlantic sturgeon *(Acipenser oxyrinchus oxyrinchus)* may be present. In addition, the threatened Gulf of Maine DPS of Atlantic sturgeon may also be present.

The project will involve constructing a new pier between the current Pier 54 footprint and the Pier 56 footprint to the north. As the project is likely to involve driving of piles, we are providing information on the effects of noise on sturgeon. The following levels of underwater noise are believed to cause injury or behavioral disturbance to sturgeon:

Injury: 206 dB re 1 μPa_{peak} and 187 dB_{cSEL} (dual standard)
Behavioral Disturbance: 150 dB re 1 μPa_{RMS}

Subadult and adult shortnose sturgeon present in the lower Hudson River would likely be using the action area as a migration corridor to and from foraging, overwintering, and/or spawning grounds located upstream of the action area. Due to the distance from shortnose sturgeon spawning grounds in the Hudson River and the higher salinity of the action area, shortnose sturgeon eggs or larvae, whose occurrence is limited to the low salinity waters near the spawning grounds, and young of the year (YOY), whose occurrence is also restricted to areas of low salinity, will not occur in the action area.

Subadult and adult Atlantic sturgeon from any DPS may be present in the river. The New York Bight DPS of Atlantic sturgeon is the only DPS that spawns in the Hudson River. The project location is not a known overwintering, spawning, or foraging ground, and early life stages are not expected at this point in the river, as they are restricted to areas of low salinity.

To minimize the exposure of endangered and threatened subadult and adult sturgeon to injurious or disturbing levels of underwater noise, we recommend the following best management practices during all pile driving operations:

- Use of a soft start
- Use of a vibratory hammer. Vibratory hammers are believed to result in underwater noise levels approximately 10 dB below the levels produced by impact hammers.[1]
- Use of an impact hammer with a wooden cushion block. Wooden cushion blocks have been shown to reduce underwater noise by approximately 11-26 dB.[2]
- Use of dewatered casings or enclosed bubble curtains to further assist in reducing underwater noise levels. Depending on size, these devices can provide between a 5 to 20 dB reduction in noise.[3]

Conclusion
As listed species of sturgeon occur in the Hudson River, and thus, within the vicinity of your proposed project, any proposed in-water work has the potential to impact these species. As project details become finalized, a consultation, pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended, may be necessary as any discretionary federal action, such as the approval or funding of a project by a federal agency, that may affect a listed species must undergo consultation pursuant to section 7 of the ESA of 1973, as amended. If the proposed project has the potential to affect listed species, and it is being approved, permitted or funded by a Federal agency, the lead Federal agency, or their designated non-Federal representative, is responsible for determining whether the proposed action is likely to affect the listed species. The Federal agency would submit their determination along with justification for their determination and a request for concurrence, to the attention of the ESA Section 7 Coordinator, NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930. After reviewing this information, NMFS would then be able to conduct a consultation under section 7 of the ESA. Should you have any questions about these comments or about the section 7 consultation process in general, please contact Jennifer Goebel at 978-281-6373 or by email jennifer.goebel@noaa.gov).

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[1] Illingworth and Rodkin, Inc. and Jones and Stokes. 2009. Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for California Department of Transportation.

[2] Id.

[3] Id.

Essential Fish Habitat

The Hudson River provides habitat for a wide variety of resident, migratory and forage species including striped bass, alewife, blueback herring, weakfish, tautog, American eel, winter flounder, summer flounder and many others. Depending upon the nature and extent of the work proposed, seasonal in-water work restrictions or other conditions may be required to avoid, minimize or mitigate for any adverse effects to aquatic resources and their habitats. In addition, Essential Fish Habitat (EFH) has been designated within the project area. EFH consultation by the federal action agency may be required as part of the federal permit process. For a listing of EFH and further information, please go to our website at: http://www.nero.noaa.gov/habitat. If you wish to discuss this further, please call 732-872-3023 or email karen.greene@noaa.gov.

Sincerely,

Mark Murray-Brown

for Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

EC: Greene, NMFS/HCD
Goebel, NMFS/PRD

File Code: Section 7/Nonfisheries/ACOE/Technical Assistance/2014/AKRF Pier 54

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 SMITH ROAD
SHIRLEY, NY 11967
PHONE: (631)286-0485 FAX: (631)286-4003

Consultation Tracking Number: 05E1LI00-2015-SLI-0014 November 13, 2014
Project Name: Pier 54

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Pier 54

Official Species List

Provided by:

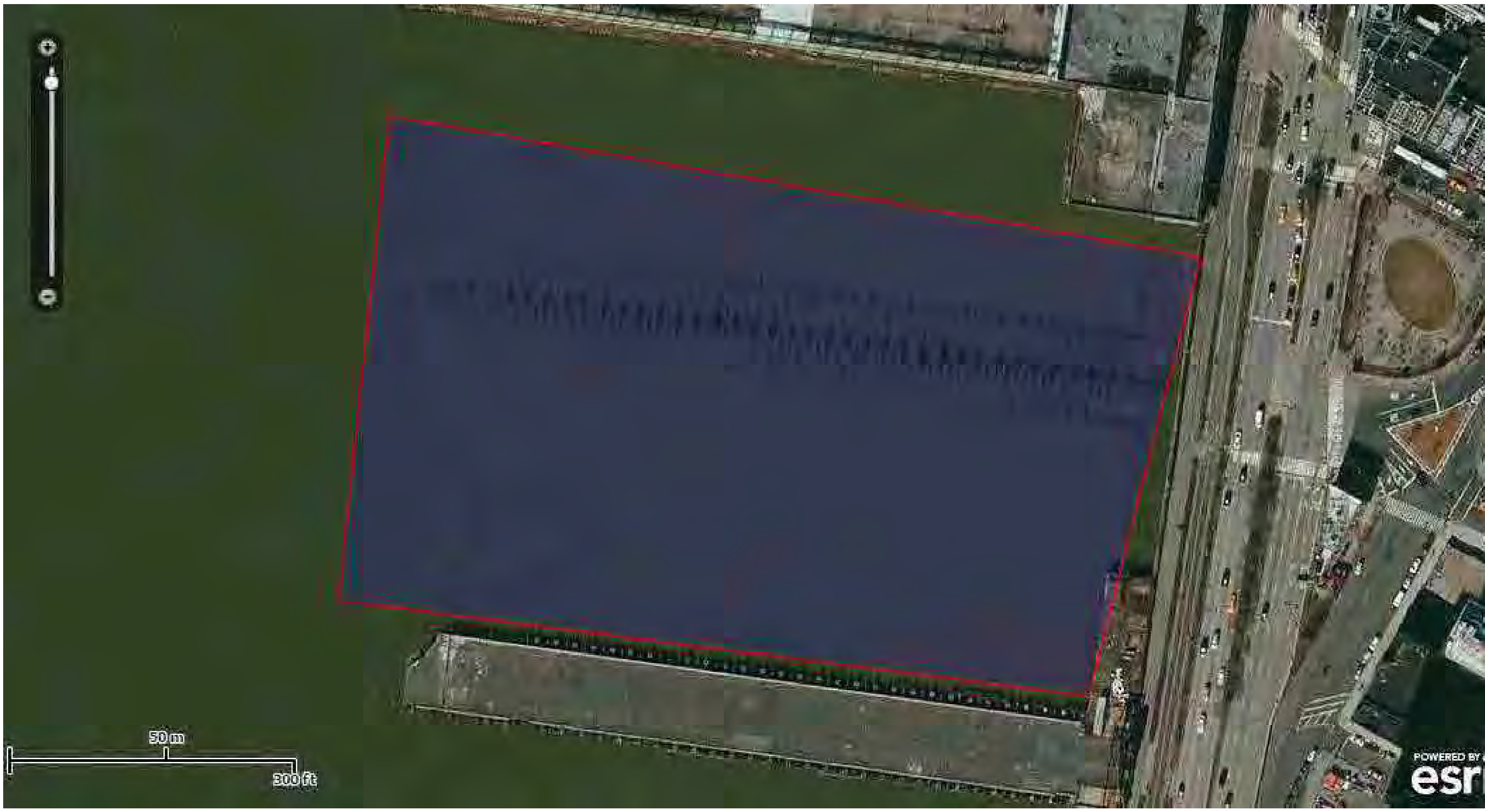
Long Island Ecological Services Field Office
340 SMITH ROAD
SHIRLEY, NY 11967
(631) 286-0485

Consultation Tracking Number: 05E1LI00-2015-SLI-0014
Project Type: ** Other **
Project Description: Reconstruction of Pier 54 within the interpier area between the Pier 56 pile field and the existing Pier 54 location

United States Department of Interior
Fish and Wildlife Service

Project name: Pier 54

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-74.0121839 40.7432127, -74.009094 40.7428062, -74.0095221 40.741539, -74.012377 40.7418145, -74.0121839 40.7432127)))

Project Counties: New York, NY

Endangered Species Act Species List

There are a total of 1 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Mammals	Status	Has Critical Habitat	Condition(s)
northern long-eared Bat *(Myotis septentrionalis)*	Proposed Endangered		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix B
Waterfront Revitalization Program CAF

For Internal Use Only:	WRP no.____________________________
Date Received:______________________	DOS no.____________________________

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM
Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP, or other local, state or federal discretionary review procedures, and that are within New York City's designated coastal zone, must be reviewed and assessed for their consistency with the *New York City Waterfront Revitalization Program (WRP)*. The WRP was adopted as a 197-a Plan by the Council of the City of New York on October 13, 1999, and subsequently approved by the New York State Department of State with the concurrence of the United States Department of Commerce pursuant to applicable state and federal law, including the Waterfront Revitalization of Coastal Areas and Inland Waterways Act. As a result of these approvals, state and federal discretionary actions within the city's coastal zone must be consistent to the maximum extent practicable with the WRP policies and the city must be given the opportunity to comment on all state and federal projects within its coastal zone.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, other state agencies or the New York City Department of City Planning in their review of the applicant's certification of consistency.

A. APPLICANT

1. Name: **Hudson River Park Trust, c/o Noreen Doyle, Executive Vice President**

2. Address: **Pier 40, 353 West Street**

3. Telephone: **212-627-2020** Fax: **NA** E-mail: **ndoyle@hrpt.ny.gov**

4. Project site owner: **Hudson River Park Trust**

B. PROPOSED ACTIVITY

1. Brief description of activity:

   The Hudson River Park Trust (HRPT) (the project sponsor) proposes to redevelop Pier 54 and reopen it as a public park pier for use as both a general recreation space and an event space (the proposed project). The proposed project would involve the construction of a public park pier with a different overwater footprint than the existing Pier 54, containing approximately 117,000-gross-square-feet (gsf) of open space and the creation of approximately 1.9 acres of pile field habitat.

2. Purpose of activity:

   Consistent with the Hudson River Park Act, the purpose of the proposed Pier 54 project is to utilize the Hudson River waterfront for the public benefit, making it an asset for the City, State, and the region. The Pier 54 project would reestablish public access to the waterfront at this location. It would provide additional public open space resources and cultural space within Hudson River Park in a manner that allows for greater functionality and programming flexibility while minimizing potential impacts to resources of the Hudson River and maintaining consistency with the Hudson River Park Estuarine Sanctuary Management Plan. The design of the proposed pier would provide a second means of egress from the pier, and the additional space and sloped landscape would allow for the separation of open space and programmed areas, creating spaces for relaxation and cultural events.

3. Location of activity: (street address/borough or site description):

   Hudson River waterfront, at the existing Pier 54 and between the current Pier 54 footprint and the Pier 56 pile field to the north, within Hudson River Park at approximately West 13th Street in Manhattan.

Proposed Activity Cont'd

4. If a federal or state permit or license was issued or is required for the proposed activity, identify the permit type(s), the authorizing agency and provide the application or permit number(s), if known:
   - **HRPT approval of lease terms and amendment to the Park's existing General Project Plan.**
   - **Approval of this action is considered a "significant action" in the Hudson River Park Act, and therefore requires a public hearing and comment period prior to any vote.**
   - **Modifications to the previously issued New York State Department of Environmental Conservation (NYSDEC) permit under Article 15 of the ECL Protection of Waters, and Water Quality Certification under Section 401 of the Clean Water Act.**
   - **Modifications to the previously issued United States Army Corps of Engineers (USACE) permits under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act for construction of the proposed project within the Hudson River.**

5. Is federal or state funding being used to finance the project? If so, please identify the funding source(s).

   No

6. Will the proposed project require the preparation of an environmental impact statement?

   Yes __________ No ✓__________ If yes, identify Lead Agency:

7. Identify **city** discretionary actions, such as a zoning amendment or adoption of an urban renewal plan, required for the proposed project.

   None

C. COASTAL ASSESSMENT

Location Questions:	Yes	No
1. Is the project site on the waterfront or at the water's edge?	✓	
2. Does the proposed project require a waterfront site?	✓	
3. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land underwater, or coastal waters?	✓	

Policy Questions:	Yes	No

The following questions represent, in a broad sense, the policies of the WRP. Numbers in parentheses after each question indicate the policy or policies addressed by the question. The new Waterfront Revitalization Program offers detailed explanations of the policies, including criteria for consistency determinations.

Check either "Yes" or "No" for each of the following questions. For all "yes" responses, provide an attachment assessing the effects of the proposed activity on the relevant policies or standards. Explain how the action would be consistent with the goals of those policies and standards.

See Attachment B, "Land Use, Zoning, and Public Policy" for a discussion of the relevant policies for each "yes" response. The relevant polices for each question are provided in parenthesis after the question.

Policy Questions cont'd		Yes	No
4.	Will the proposed project result in revitalization or redevelopment of a deteriorated or under-used waterfront site? (1)	✓	
5.	Is the project site appropriate for residential or commercial redevelopment? (1.1)		✓
6.	Will the action result in a change in scale or character of a neighborhood? (1.2)		✓
7.	Will the proposed activity require provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (1.3)		✓
8.	Is the action located in one of the designated Significant Maritime and Industrial Areas (SMIA): South Bronx, Newtown Creek, Brooklyn Navy Yard, Red Hook, Sunset Park, or Staten Island? (2)		✓
9.	Are there any waterfront structures, such as piers, docks, bulkheads or wharves, located on the project sites? (2)	✓	
10.	Would the action involve the siting or construction of a facility essential to the generation or transmission of energy, or a natural gas facility, or would it develop new energy resources? (2.1)		✓
11.	Does the action involve the siting of a working waterfront use outside of a SMIA? (2.2)		✓
12.	Does the proposed project involve infrastructure improvement, such as construction or repair of piers, docks, or bulkheads? (2.3, 3.2)	✓	
13.	Would the action involve mining, dredging, or dredge disposal, or placement of dredged or fill materials in coastal waters? (2.3, 3.1, 4, 5.3, 6.3)		✓
14.	Would the action be located in a commercial or recreational boating center, such as City Island, Sheepshead Bay or Great Kills or an area devoted to water-dependent transportation? (3)	✓	
15.	Would the proposed project have an adverse effect upon the land or water uses within a commercial or recreation boating center or water-dependent transportation center? (3.1)		✓
16.	Would the proposed project create any conflicts between commercial and recreational boating? (3.2)		✓
17.	Does the proposed project involve any boating activity that would have an impact on the aquatic environment or surrounding land and water uses? (3.3)		✓
18.	Is the action located in one of the designated Special Natural Waterfront Areas (SNWA): Long Island Sound-East River, Jamaica Bay, or Northwest Staten Island? (4 and 9.2)		✓
19.	Is the project site in or adjacent to a Significant Coastal Fish and Wildlife Habitats? (4.1)	✓	
20.	Is the site located within or adjacent to a Recognized Ecological Complex: South Shore of Staten Island or Riverdale Natural Area District? (4.1and 9.2)		✓
21.	Would the action involve any activity in or near a tidal or freshwater wetland? (4.2)		✓
22.	Does the project site contain a rare ecological community or would the proposed project affect a vulnerable plant, fish, or wildlife species? (4.3)	✓	
23.	Would the action have any effects on commercial or recreational use of fish resources? (4.4)		✓
24.	Would the proposed project in any way affect the water quality classification of nearby waters or be unable to be consistent with that classification? (5)		✓
25.	Would the action result in any direct or indirect discharges, including toxins, hazardous substances, or other pollutants, effluent, or waste, into any waterbody? (5.1)		✓
26.	Would the action result in the draining of stormwater runoff or sewer overflows into coastal waters? (5.1)	✓	
27.	Will any activity associated with the project generate nonpoint source pollution? (5.2)	✓	

Policy Questions cont'd:	Yes	No
28. Would the action cause violations of the National or State air quality standards? (5.2)		✓
29. Would the action result in significant amounts of acid rain precursors (nitrates and sulfates)? (5.2C)		✓
30. Will the project involve the excavation or placing of fill in or near navigable waters, marshes, estuaries, tidal marshes or other wetlands? (5.3)		✓
31. Would the proposed action have any effects on surface or ground water supplies? (5.4)		✓
32. Would the action result in any activities within a federally designated flood hazard area or state designated erosion hazards area? (6)	✓	
33. Would the action result in any construction activities that would lead to erosion? (6)		✓
34. Would the action involve construction or reconstruction of a flood or erosion control structure? (6.1)		✓
35. Would the action involve any new or increased activity on or near any beach, dune, barrier island, or bluff? (6.1)		✓
36. Does the proposed project involve use of public funds for flood prevention or erosion control? (6.2)		✓
37. Would the proposed project affect a non-renewable source of sand? (6.3)		✓
38. Would the action result in shipping, handling, or storing of solid wastes, hazardous materials, or other pollutants? (7)		✓
39. Would the action affect any sites that have been used as landfills? (7.1)		✓
40. Would the action result in development of a site that may contain contamination or has a history of underground fuel tanks, oil spills, or other form or petroleum product use or storage? (7.2)		✓
41. Will the proposed activity result in any transport, storage, treatment, or disposal of solid wastes or hazardous materials, or the siting of a solid or hazardous waste facility? (7.3)		✓
42. Would the action result in a reduction of existing or required access to or along coastal waters, public access areas, or public parks or open spaces? (8)		✓
43. Will the proposed project affect or be located in, on, or adjacent to any federal, state, or city park or other land in public ownership protected for open space preservation? (8)	✓	
44. Would the action result in the provision of open space without the provision for its maintenance? (8.1)		✓
45. Would the action result in any development along the shoreline but NOT include new water-enhanced or water-dependent recreational space? (8.2)		✓
46. Will the proposed project impede visual access to coastal lands, waters and open space? (8.3)		✓
47. Does the proposed project involve publically owned or acquired land that could accommodate waterfront open space or recreation? (8.4)	✓	
48. Does the project site involve lands or waters held in public trust by the state or city? (8.5)	✓	
49. Would the action affect natural or built resources that contribute to the scenic quality of a coastal area? (9)	✓	
50. Does the site currently include elements that degrade the area's scenic quality or block views to the water? (9.1)		✓

Policy Questions cont'd:		**Yes**	**No**
51.	Would the proposed action have a significant adverse impact on historic, archeological, or cultural resources? (10)		✓
52.	Will the proposed activity affect or be located in, on, or adjacent to an historic resource listed on the National or State Register of Historic Places, or designated as a landmark by the City of New York? (10)	✓	

D. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's Waterfront Revitalization Program, pursuant to the New York State Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If the certification can be made, complete this section.

"The proposed activity complies with New York State's Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent Name: **Hudson River Park Trust**

Address: **Pier 40, 353 West Street**

New York, NY 10014 Telephone **212-627-2020**

Applicant/Agent Signature: [signature] Date: 2-11-15

William Heinzen
General Counsel

Appendix C
Analysis of the Potential for Underwater Noise to Adversely Affect Threatened or Endangered Species

A. INTRODUCTION

NMFS (2014a) has identified certain levels of underwater noise that are believed to cause injury or behavioral disturbance to sturgeon. To minimize exposure of sturgeon to these noise levels, NMFS recommends measures including pile tapping and use of wooden cushion blocks (see **Appendix A to EAF**). These measures would be implemented for the proposed project. Because the proposed project would only require short periods of impact pile driving to seat the pile into bedrock (i.e., approximately 90 minutes per day), the daily duration of elevated underwater noise exceeding those levels associated with injury is relatively short. The following sections provide a detailed analysis of the potential for underwater noise from pile driving for the proposed project to result in significant adverse impacts to Atlantic and shortnose sturgeon and marine turtles. The results of that analysis demonstrate that underwater noise levels exceeding those associated with injury will not affect the deeper water habitats of the navigation channel (located more than 200 feet from pile driving) that sturgeon most commonly inhabit within the Hudson River. Similarly, underwater noise levels associated with behavioral avoidance of sturgeon will be minimized through the use of a wooden cushion block as recommended by NMFS, and would not obstruct movement of migrating sturgeon past the project. In conclusion, the proposed project may affect but is unlikely to adversely affect shortnose and Atlantic sturgeon, and there will not be any incidental take for Atlantic or shortnose sturgeon as a result of impact pile driving of concrete piles for the proposed project.

B. PILE DRIVING

LOAD-BEARING PILES

In-water construction at Pier 54 will include the installation of 387 precast/prestressed concrete piles (20", 24", and 36" diameter) to support the new overwater platform and accessways, and the amphitheater support/undercroft area and seasonal vessel dock. As summarized in Table 1 above, the majority (68%) of concrete piles are 36" diameter, while fewer of the piles are 24" (24%) and 20" diameter (8%). Impact pile driving times for these concrete piles is expected to be less than 15 minutes each and approximately 6 piles will be driven during a work day, which equates to 90 minutes of impact pile driving per day. Pile driving is expected to utilize a diesel impact hammer with a cushion block to protect the pile from damage and to minimize underwater noise during driving[1]. The impact hammer will have a nominal energy of approximately 75 to 95 kips-feet; however, hammer operation is likely to occur at one-half

[1] Although NMFS typically recommends the use of vibratory hammers as a (BMP) for minimizing underwater noise levels during pile driving, the vibratory hammer is not used for concrete piles because this installation method causes damage to concrete piles. Therefore, this BMP is not an option for driving concrete piles for this project.

nominal energy to minimize pile stress. At these levels (less than 50 kips-feet), underwater noise levels will be significantly less than those used in this analysis (i.e., 79 to 165 kips-feet). Therefore, the estimates of noise isopleth sizes are conservative; actual underwater noise levels during impact pile driving are expected to be lower than those presented here. This analysis of underwater noise associated with impact pile driving of load-bearing piles for Pier 54 demonstrates that this in-water activity would not adversely affect sturgeon or marine turtles.

NON-LOAD-BEARING PILES

The additional 160 non-load bearing piles driven for moorings, fenders, and breastings will be installed using a vibratory hammer and will not require impact hammering. Noise levels associated with the vibratory driving of these piles are relatively quiet compared to impact pile driving and the sound is continuous rather than impulsive[1]. Therefore, underwater noise impacts would not occur during the installation of non-load bearing piles and no further analysis is conducted for these piles.

C. NOISE CRITERIA FOR ASSESSING THE POTENTIAL EFFECTS OF IMPACT PILE DRIVING OF LOAD-BEARING PILES

For the proposed impact pile-driving activities necessary to complete the project, the spatial extent (i.e., distance from the pile) of underwater noise isopleths was estimated based on thresholds used by NMFS, USACE, NYSDEC and other permitting agencies to assess the potential for impacts to fish and marine turtles in the vicinity of impact pile-driving activities. These thresholds are associated with the peak and cumulative underwater noise levels at which fish and marine turtles may experience recoverable physiological effects, such as hematoma, hemorrhaging, or rupturing of the swim bladder for fish, including Atlantic and shortnose sturgeon. These thresholds are conservative based on the results of recent studies that demonstrate the onset of physiological effects for fish is at levels approximately 20 dB greater than the traditionally used values (Casper et al. 2012, Halvorsen et al. 2012a, Halvorsen et al. 2012b).

For sturgeon, the thresholds for the onset of recoverable physiological effects are:

- 206 dB re: 1 µPa peak sound pressure level (SPL_{peak}); and
- 187 dB re: 1 μPa^2•s cumulative sound exposure level (SEL_{cum}).

For marine turtles, the physiological threshold is:

- 207 dB re: 1 µPa root-mean square sound pressure level (SPL_{rms}).

Thresholds for the behavioral avoidance of impact pile driving were also used to assess the potential for underwater noise to obstruct movement of sturgeon and marine turtles through the Hudson River in the vicinity of the action area. In order to ensure that impact pile driving does not interfere with the migration of sturgeon and marine turtles, there must be an adequate "non-ensonified" corridor within the river where noise levels do not exceed the following thresholds.

---

[1] Impulsive sounds such as those generated during impact pile driving are defined by a rapid rise-time, short duration, and high amplitude, which transmit more energy over a shorter period of time than a continuous sound, thus increasing the likelihood of tissue damage from impulsive sounds (Hawkins and Popper 2014).

For sturgeon, the behavioral threshold above which ensonified areas may be avoided is:

- 150 dB re: 1 μPa SPL_{rms}.

For marine turtles, the behavioral threshold is:

- 166 dB re: 1 μPa SPL_{rms}.

D. ESTIMATING THE SPATIAL EXTENT OF UNDERWATER NOISE ISOPLETHS

The spatial extent of underwater noise at or above threshold levels during impact pile driving of unattenuated concrete piles was estimated using the practical spreading loss model and underwater noise data measured during impact pile driving of concrete piles at the Port of Oakland, California (Caltrans 2012). Pile driving was conducted at the Port of Oakland using a diesel impact hammer and a wooden cushion block, which protects the pile from damage and reduces underwater noise levels during driving. For unattenuated 24-inch concrete piles, noise levels at a distance of 33 feet from the pile have been reported as 185 dB for the SPL_{peak} noise levels, 173 dB for the SPL_{rms}, and 163 dB for the single-strike sound exposure level (SEL_{ss}), which is used to estimate the SEL_{cum}.

The practical spreading loss model estimates the decrease in underwater noise as the sound pressure wave propagates away from the pile and the distance at which noise levels are equal to the physiological and behavioral thresholds for fish and marine turtles. Because the noise level produced at the source during pile driving diminishes naturally as the sound-pressure wave propagates through the water and away from the pile, this natural attenuation is included in the practical spreading loss model. The rate at which the noise level diminishes (i.e., attenuates) may vary depending on environmental conditions where the pile is being driven. For this analysis, an attenuation factor of 15 was used, as recommended by NMFS as a conservative estimate when the actual level of natural noise attenuation is unknown[1].

Unlike noise criteria that are based on sound pressure (SPL_{peak} and SPL_{rms}), the level of sound exposure for an aquatic organism is dependent on the amount of sound energy that an organism receives over a number of pile strikes. In order to calculate the SEL_{cum}, the following equation was used:

$$SEL_{cum} = SEL_{ss} + (10*\log(\text{number of pile strikes}))$$

The number of pile strikes was calculated as the product of the hammer rate (i.e., 50 strikes per minute) and a pile-driving time of 15 minutes. Assuming that six piles will be driven each day, the total number of strikes for each pile would be 750 strikes and a total of 4,500 strikes per day to install 6 piles.

E. POTENTIAL NOISE IMPACTS TO ATLANTIC AND SHORTNOSE STURGEON

Only transient subadult and adult shortnose and Atlantic sturgeon are likely to be present in the action area as they migrate to and from foraging, overwintering, and/or spawning grounds. Early life stages and young-of-the-year (YOY) sturgeon will not occur in the action area and will

[1] http://www.dot.ca.gov/hq/env/bio/files/NMFS%20Pile%20Driving%20Calculations.xls

therefore not be affected by in-water construction activities, including underwater noise from pile driving.

For fishes, such as Atlantic and shortnose sturgeon, the peak noise levels associated with the recoverable physiological effects (i.e., 206 dB re: 1µPa SPL_{peak}) are not likely to be experienced during impact pile driving for concrete piles; source levels at the pile would rapidly attenuate from 206 dB to quieter levels beyond 1 foot of the pile. Cumulative underwater noise levels associated with recoverable physiological effects (187 dB re: 1µPa^2•sec SEL_{cum}) would not occur beyond 65 feet for 1 pile and 225 feet for 6 piles (see **Figure C-1**). Based on these distances, threshold noise levels will not extend beyond the pierhead line or into the deep waters (>20 feet deep) of the navigation channel where sturgeon most commonly occur. Therefore, sturgeon migrating through the navigation channel and past the project will not be exposed to noise levels that could cause physiological effects.

Because sturgeon are mobile and likely to avoid underwater noise from pile driving, potential exposure to noise levels of 187 dB SEL_{cum} for any occasional transient sturgeon that may occur in the shallow interpier area adjacent to the navigation channel would be limited. A similar determination was made by NMFS in its Biological Opinion for the New NY Bridge at Tappan Zee (NMFS 2013) in which it was stated that "it is reasonable to conclude that sturgeon will avoid areas in proximity of impact pile-driving operations and are highly unlikely to remain in the vicinity of pile driving long enough to reach the cumulative threshold associated with the potential onset of physiological effects. This is consistent with the analysis and assumptions presented in our 2012 Biological Opinion which assessed the potential for injury using the peak SPL criterion of 206 dB re 1 µPa (rather than the cumulative criterion of 187 dB re 1 µPa^2•s)."

The spatial extent of underwater noise that exceeds 150 dB SPL_{rms} (i.e., threshold for behavioral avoidance by fish) would occur approximately 1,100 feet from the pile during impact pile driving (see **Figure C-1**). At that distance, these noise levels will occur across 35% of the river, but only 20% of the deep navigation channel where sturgeon are most likely to occur. Therefore, 80% of the navigation channel will be unobstructed for Atlantic and shortnose sturgeon migrating to and from foraging, overwintering, and/or spawning grounds located upstream of the project's action area. Moreover, the duration of impact pile driving during any given work day would not exceed 1.5 hours. Therefore, 100% of the navigation channel will be non-ensonified by noise from impact pile driving during the majority (i.e., 22.5 hours) of every day. In addition, pile driving will only occur between May 1 and October 31, further limiting the likelihood of exposure of sturgeon to underwater noise.

Given the results of this analysis, underwater noise generated during impact pile driving for Pier 54 would not adversely affect sturgeon for several reasons. First, the spatial extent of underwater noise associated with recoverable injury for sturgeon would not extend beyond the immediate vicinity of impact pile driving. Second, the duration of impact pile driving would be limited to less than 90 minutes per day and less than six months per year. And lastly, the spatial extent and duration of noise levels associated with behavioral avoidance by sturgeon will be limited and will not deter migrating sturgeon (i.e., a non-ensonified acoustic corridor will exist across 80% of the navigation channel for 150 dB SPL_{rms} noise levels and 100% of the navigation channel for 187 dB SEL_{cum} and 206 dB SPL_{peak} levels). Similar conditions (i.e., small piles, pile driving in shallow water outside of deep waters where sturgeon are mainly found, noise levels below 206 dB SPL_{peak} and 187 dB SEL_{cum} across 100% of the navigation channel) were evaluated for impact pile-driving activities for steel pipe piles at the Port of Coeymans, for which the NYSDEC (2014) determined that there would not "likely" be any incidental take for sturgeon.

Similarly, the NMFS 2014b determined that, due to the limited spatial and temporal extent of impact driving of steel piles "we do not anticipate any take of shortnose or Atlantic sturgeon resulting from dredging or pile installation at the Coeymans staging area." For these reasons, it is concluded that there will not likely be any incidental take for Atlantic or shortnose sturgeon as a result of impact pile driving of concrete piles at Pier 54.

F. POTENTIAL NOISE IMPACTS TO MARINE TURTLES

Based on the results of the underwater noise analysis conducted for impact pile driving of concrete piles at Pier 54 discussed for Atlantic and shortnose sturgeon, those transient turtles that may occasionally occur in the lower Hudson River are not likely to be adversely affected by underwater noise from impact pile driving.

Underwater noise levels associated with recoverable physiological effects to marine turtles (207 dB SPL_{rms}) would not occur during impact pile driving for concrete piles. Source levels within 1 foot of the pile would not exceed 201 dB SPL_{rms} based on this analysis. Therefore, marine turtles will not experience physiological effects caused by impact pile driving at Pier 54.

Underwater noise levels associated with behavioral avoidance by marine turtles (166 dB SPL_{rms}) are not likely to occur beyond a distance of 100 feet from concrete piles during impact pile driving at Pier 54. Because the piles closest to the navigation channel occur at a distance of 300 feet inside the pierhead line, these noise levels will be limited to the interpier area and will not be experienced by transient turtles that may occur as occasional transients in the deeper waters of the navigation channel beyond the pierhead line. Therefore, marine turtles will not experience behavioral effects caused by impact pile driving at Pier 54.

As concluded for sturgeon, underwater noise generated during impact pile driving for Pier 54 would not adversely affect marine turtles due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects to turtles. As such, it is concluded that there will be no incidental take of marine turtles as a result of impact pile driving of concrete piles at Pier 54. This determination is consistent with the not-likely-to-affect conclusion issued by USACE and NMFS in the 2000 Memorandum for the Record issued for the Hudson River Park (USACE 2000).

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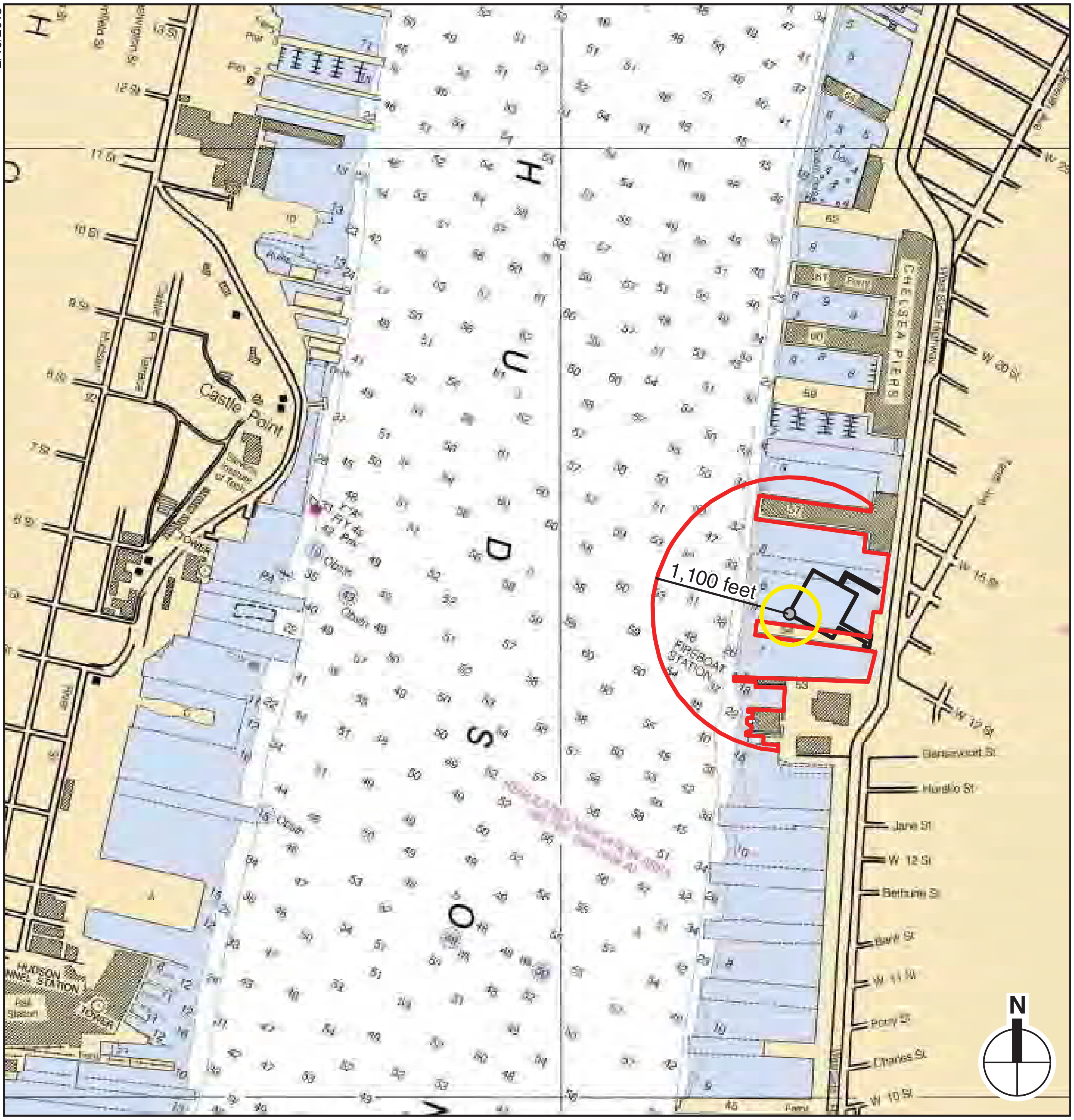
2/10/2015



(red line)	*150 dB re: 1 uPa SPLrms (behavioral effects)*
(yellow line)	*187 dB re: 1 uPa2-s SELcum (physiological effects; cumulative over 6 piles)*
Not visible at this scale	*206 dB re: 1 uPa SPLpeak (physiological effects; within 1 foot of the pile)*

Spatial extent of underwater noise associated with noise criteria for assessing impacts to fish during impact pile driving at Pier 54

Hudson River Park - Pier 54 and Pier 54 Pile Field

Figure C-1

Appendix D
Essential Fish Habitat Assessment

Pier 54 and Pier 54 Pile Field
New York, New York
Essential Fish Habitat Assessment

A. INTRODUCTION

Essential fish habitat (EFH) is defined under the Magnuson-Stevens Fishery Conservation Management Act (16 USC §§ 1801 to 1883), as amended by the Sustainable Fisheries Act (SFA) of 1996, as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." "Waters" include aquatic areas and their physical, chemical and biological properties that are used by fish. "Substrate" includes sediment, hard bottom, structures, and associated biological communities that are under the water column. Waters and substrates necessary for fish spawning, breeding, feeding or growth to maturity—covering all stages within the life cycle of a particular species—refers to those habitats required to support a sustainable fishery and a particular species' contribution to a healthy ecosystem (50 Code of Federal Regulations (CFR) 600.10).

Section 303(a)(7) of the Magnuson-Stevens Act requires that the eight Regional Fishery Management Councils (RFMC) describe and identify EFH for each Federally managed species, and minimize adverse impacts from fishing activities on EFH. Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines the process for providing the National Marine Fisheries Service (NMFS) within the National Oceanic and Atmospheric Administration (NOAA), and the RFMC with the opportunity to comment on activities proposed by Federal agencies that have the potential to adversely impact EFH areas. Federal agencies are required to consult with NMFS (using existing consultation processes for the National Environmental Policy Act (NEPA), the Endangered Species Act, or the Fish and Wildlife Coordination Act) on any action that they authorize, fund or undertake that may adversely impact EFH.

Adverse impacts to EFH, as defined in 50 CFR 600.910(A) include any action that reduces the quality and/or quantity of EFH. Adverse impacts may include:

- direct impacts such as physical disruption or the release of contaminants;
- indirect impacts such as the loss of prey, reduction in the fecundity (number of offspring produced) of a managed species; and
- site-specific or habitat-wide impacts that may include individual, cumulative or synergetic consequences of a Federal action.

An EFH assessment of a Federal action that may adversely impact EFH must contain:

- a description of the Proposed Project;
- an analysis of the effects, including cumulative, on EFH, the managed species and associated species such as major prey species, and the life history stages that may be affected;
- the agency's conclusions regarding the effects of the action on EFH; and
- proposed mitigation if applicable (50 CFR 600.920(g)).

The following sections describe:

- the project actions that have potential to affect aquatic resources at Pier 54 (project site);

- existing water and sediment quality within the lower Hudson River where the Proposed Project is located;
- potential impacts to aquatic biota and habitat that may result from the Proposed Project activities;
- the species for which EFH has been identified near Pier 54 and potential impacts to their habitats; and
- potential impacts to non-EFH species which are also under the jurisdiction of the NMFS: shortnose sturgeon (*Acipenser brevirostrum*), a federal and state-listed endangered species, Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) a federally listed endangered species, striped bass (*Morone saxatilis)* a federally managed species, as well as four species of state and federally listed marine turtles with the potential to occur in the vicinity of the Proposed Project as seasonal transients.

B. PROJECT DESCRIPTION

OVERVIEW

Pier 54 is part of the 550-acre Hudson River Park, which was the subject of an environmental review in the late 1990s (Hudson River Park Final Environmental Impact Statement [FEIS], May 1998). Pier 54 is a designated “park use” pier within the Hudson River Park Act, Chapter 592 of the Laws of 1998 (“the Act”), as amended in 2013. The adoption of the 2013 amendment to the Act authorizes the reconstruction of a larger Pier 54 outside of its historic footprint. Since the Act was passed, and permits issued and renewed by the USACE and NYSDEC (USACE Permit 1998-00290, and NYSDEC Permit 2-6299-00004/00001), the Hudson River Park Trust (HRPT) has been constructing and operating Hudson River Park in accordance with the Act and the Park’s General Project Plan, and the USACE and NYSDEC permits and subsequent construction authorizations.

The Hudson River Park Trust (HRPT) (the project sponsor) proposes to reconstruct Pier 54 within Hudson River Park (HRP) within the interpier area immediately north of its current location and reopen it as a public park pier with rolling topography for use as both a general recreation and cultural events space. As shown in **Figures 1 and 2**, the project site is located between the current Pier 54 footprint and the Pier 56 pile field and Pier 57 to the north, at approximately West 13th Street. As part of the project, the piles at the existing Pier 54 will be left in place to create the Pier 54 pile field (approximately 1.9 acres) to enhance fish and wildlife habitat. The reconstruction of Pier 54 and designation of the Pier 54 pile field comprise the Proposed Project.

The Proposed Project requires modifications to the previously issued US Army Corps of Engineers (USACE) and New York State Department of Environmental Conservation (NYSDEC) permits, and subsequent renewals, to the HRPT for the development of the park (USACE Permit 1998-00290, and NYSDEC Permit 2-6299-00004/00001). These prior permits authorized the reconstruction and rehabilitation of the existing Pier 54 structure in its current location. Over the course of several years, HRPT was forced to close most of the existing Pier 54 because of deteriorated pile and platform conditions and is now seeking to reconstruct it so it can resume use by the public. Approximately ¼ of the pier’s original footprint remains open for public use. The Proposed Project would create a new pier just north of the existing Pier 54 platform.

1.29.15

Project Site

Hudson River Park

Project Location

Hudson River Park - Pier 54 and Pier 54 Pile Field

Figure 1

SOURCE: Heatherwick Studio

For Illustrative Purposes Only

Bird's Eye View of the Proposed Project

Figure 2

The reconstruction of Pier 54 (Pier 54) and creation of the Pier 54 pile field has undergone extensive environmental review and an Environmental Assessment Form prepared under the New York State Environmental Quality Review Act with responses to public comments received on the project (http://www.hudsonriverpark.org/vision-and-progress/planning-and-construction/meatpacking-district/pier-54-public-review).

Unlike other existing piers in Hudson River Park, the Proposed Project consists of a square-shaped rather than rectangular pier, and would create a natural rolling landscape. The elevations of the proposed pier platform will range from 9.65 feet to 63.65 feet North American Vertical Datum of 1988 (NAVD88); the vast majority of the proposed Pier 54 would be at elevation 16.65 feet NAVD88 or higher, contributing to flood resilience to create the topographically variable public space. Elevating the piles and pier deck at the pier corners will introduce light beneath the pier, thereby minimizing shading impacts to aquatic habitat. The pier would be supported on piles that would rise from the Hudson River and widen as they approach the pier platform to create the appearance of “pots” supporting the park landscape.

The proposed Pier 54 structure will result in approximately 2.7 acres of overwater structure consisting of a new 320-by-320-foot platform for an overall pier area of 2.4 acres along with two access ramps to connect the pier to Hudson River Park’s waterfront esplanade, with an overall surface area of approximately 0.3 acres, and a 150-by-10-foot seasonal vessel dock (0.03 acres). Eight protective fender pile clusters comprising timber and steel pipe piles will protect Pier 54 but allow access to the pier for temporary mooring (no more than 6 months) of a maximum 4,000-square foot (0.09 acres) amphitheater support vessel. Mooring of this vessel would only occur when required to provide the additional support space needed to meet Actors Equity Association requirements for performances that would be held at the Pier 54 amphitheater. The overall footprint of piles supporting the pier and access ramps totals 2,502 square feet.

Under Pier 54 will be the amphitheater support/Interstitial area supported by a combination of piles and decking. As this area is under the pier, it will not contribute any additional overwater coverage.

Stormwater management measures will be incorporated in the pier design to carry runoff to the Hudson River. With the Proposed Project, precipitation that falls on planted areas will be filtered through plant roots and through a sand-based soil medium, prior to discharge to the river.

DETAILED DESCRIPTION OF THE PROPOSED PLAN

The Proposed Project calls for a limited number of activities that have the potential to affect the aquatic environment, including creation of new over-water coverage for the new pier platform, the two access ramps, the southern balcony, and the temporary amphitheater support vessel; installation of piles in the bed of the Hudson River to support the pier and fendering system; and discharge of stormwater runoff. The Proposed Project would result in an increase in overwater coverage of less than one acre when compared to the previously authorized reconstruction of Pier 54 within its current footprint) and will not require any dredging.

The new pier platform, access ramps, south balcony, and seasonal vessel dock would be supported on new piles installed in the Hudson River substrate (see **Table 1**) Additional piles will be installed to form 8 clusters of fender piles, and breasting piles and mooring dolphins associated with the seasonal vessel dock. In total the footprint of all piles would be 2,502 square feet. The Proposed Project would result in the placement of approximately 127 cubic yards (CY) of flowable concrete below mean high water (MHW) within approximately 173 of the 36-inch diameter hollow concrete piles that would support the pier, and the 6 hollow breasting piles (36-

inch diameter) and 2 hollow mooring dolphin piles (24-inch diameter) that would be installed for the seasonal vessel dock. The area inside the piles below MHW occupied by flowable concrete will total approximately 543.22 square feet. The flowable concrete placed into these piles would be confined within the piles and would not result in any significant adverse impacts to Hudson River water quality or aquatic biota.

Table 1
Approximate Number of In-Water Piles

Pile Type	Structure/Use	Number of Piles (#)	SQFT (total)
Square Precast Concrete Pile (24")	South Accessway	20	80
Square Precast Concrete Pile (24")	South Balcony	9	36
Square Precast Concrete Pile (24")	North Accessway	24	96
Round Precast Concrete Pile 36" Diameter	Pier Platform	264(1)	1,866(2)
Square Precast Concrete Pile (24")	Undercroft	38	152
Square Precast Concrete Pile (20")	Undercroft	18	50
Square Precast Concrete Pile (20")	Seasonal Vessel Dock	14	39
Concrete Filled Steel Pipe Breasting Pile 36" Diameter	Seasonal Vessel Dock	6	42
Concrete Filled Steel Pipe Mooring Dolphin 24" Diameter	Seasonal Vessel Dock	2	6
Timber Pile 12” Diameter	Protective Fender Pile Cluster	128	101
Steel Pipe Pile 16” Diameter	Protective Fender Pile Cluster	24	34
	TOTAL	547	2,502

Notes: (1) Because of the undulating topography, only 173 out of 264 piles have flowable concrete below MHW**;** (2) For the piles in which flowable concrete occurs below MHW, the area occupied by the flowable concrete within the 24 inch diameter space of the piles totals 543.22 square feet.

Installation of the piles for Pier 54 will require the removal of 14 piles from the Pier 54 pile field, and removal of 11 piles from the Pier 56 pile field. Thirty-five new piles would be driven within the Pier 54 pile field for the south balcony, the south accessway and the Pier 54 support piles, and 29 new piles would be driven within the Pier 56 pile field for the north accessway. As required by Special Condition F of the USACE permit, piles will be pulled out of the riverbed completely or cut at the mudline in a manner that does not result in substantial sediment resuspension. Consistent with USACE Permit Special Condition G, no piles will be installed or removed between November 1 and April 30 to protect overwintering fishery resources and migratory waterfowl. Following reconstruction of Pier 54, the Pier 54 pile field will be maintained in accordance with USACE Permit Special Condition M, a minimum of 75% of the pilings within the pile field footprint will be maintained for the life of the project, with all reasonable efforts made to retain or replace piles in areas of the Pier 54 pile field where the water depth exceeds 10 feet at mean low water (MLW). The Pier 54 pile field will be incorporated into the HRP long-term pile field maintenance plan prepared in compliance with USACE Permit Special Condition L.

All in-water and shoreline construction work would be done using barge-based crews. Consistent with the NYSDEC and USACE permits for in-water work within Hudson River Park, floating debris screens would be in place throughout construction activities.

Up to three barge-based construction crews are anticipated to work concurrently to perform the pile driving necessary to construct the Proposed Project. Pile driving would be conducted in two 6-month seasons between May 1 and October 31 to protect overwintering fishery resources and migratory waterfowl. Each crew would have an approximately 60-by-180-foot crane barge with impact hammer to drive the piles, and the same size material barge. The barges would not to remain at a single location for more than a few days. Pile driving crews would typically drive three 36-inch piles, six 24-inch piles, or some combination of the two, per day. Because the bottom material is soft organic silt, driving the piles to bedrock would take about 15 minutes per pile, with the remaining time used for positioning the barges, installing the pile driving template, standing the piles off and cutting piles when seated into the bedrock.

Load-bearing piles include the 24-inch precast concrete piles for the accessways, south balcony, the amphitheater support/undercroft area, the 20-inch precast concrete piles for the amphitheater support/undercroft area and seasonal vessel dock, and the 36-inch diameter precast concrete piles for the Pier 54 platform. As summarized in **Table 1** above, the majority (68%) of concrete piles are 36” diameter, while fewer of the piles are 24” (24%) and 20” diameter (8%). Prior to driving each pile, a multi-tiered template supported on temporary steel piles would be installed using a crane barge at the pile location to achieve greater pile driving precision.

To the greatest extent possible the sections comprising the concrete piles for the pier would be spliced on a barge, or in the shop, and lifted as one unit by the crane barge for installation in place within the template. However, where the bedrock is too far below the mudline, the concrete pier pile would be installed in two pieces: a steel H-pile (called a stinger) is driven first with a vibratory hammer, the concrete pile is bolted or spliced on top of the stinger, and then the concrete pile is driven to the design depth via impact hammer. The splicing connection between the concrete and steel portions of the piles seals the bottom of the concrete pile such that at the completion of driving the pile is empty. Piles with a final length that does not exceed approximately 130 feet would be installed open ended, without a steel H-pile stinger—a concrete cylinder with an open bottom driven to bedrock. After driving, these piles would have mud inside them to the mudline.

All of the precast concrete load-bearing piles would sink into the substrate under their own weight, which would limit the driving with an impact hammer. In a typical operation it might take one day, or more, to set up the driving frame, one day to lift and drop the piles into it, and a few hours to drive the piles down, with seating of the pile into bedrock with the hammer anticipated to take about 15 minutes per pile. After the piles are installed, and the driving frame is still in place, the piles would be cut-off at the locations where they fetched-up higher than intended.

Once installation of the pier platform support piles is complete, the pot capitals would be installed on the piles. A bulkhead or platform would be installed inside each pile at a depth of approximately 10 to 20 feet below the top of the pile, and a rebar cage and dowels above the bulkhead. The pot capital would be placed on top of the pile, and secured to the pile by a concrete plug. As indicated in **Table 1**, only 173 out of the 264 36-inch diameter pier support piles will have portions of the concrete plug located below MHW. The total volume of flowable concrete that would be installed below MHW is 126.8 CY.

The approximately 160 non-load bearing piles for the seasonal vessel dock moorings and breastings, and the fender clusters that will protect Pier 54 will be installed by allowing them to first sink into the substrate under their own weight and then using a vibratory hammer. These piles will not require impact hammering.

Construction of the Proposed Project would start in 2016 and will be complete by 2019. Pile driving would occur over two pile driving seasons between May 1 and October 31, in 2016 and 2017, outside of the November 1 to April 30 window in which pile driving is prohibited by the USACE and NYSDEC permits issued for Hudson River Park to protect overwintering fishery resources and migratory waterfowl.[1]

ALTERNATIVES

NO ACTION

Under the No Action alternative, Pier 54 would be reconstructed in accordance with the construction authorizations received from NYSDEC and USACE in 2005, and resume general park and event uses, consistent with its prior functions. Unlike the Proposed Project, the rebuilt pier would be rectangular in shape, similar to other piers in Hudson River Park, and its topography would be flat. The rebuilt pier would be approximately 84,300 square feet and would include a row of planters and seating, with minimal planting. It would be supported on 220 new 24 inch square concrete piles in a 30 foot by 15 foot grid and would also have new fender piles. Many of the 3,471 existing timber piles under the existing Pier 54 would remain in place in accordance with existing permit conditions but these piles would not provide structural support to the rebuilt pier.

The No Action alternative would result in approximately 1.9 acres of overwater structure. Although this area is smaller than the Proposed Project’s overwater coverage (2.7 acres), the No Action alternative would result in substantially more area of aquatic habitat within the Hudson River shaded from overwater structures because the elevation of the pier deck would be the same as the existing Pier 54 deck (elevation +7.65 feet NAVD88) which is close to the water surface (MHW is at elevation +1.96 NAVD88). Under the No Action alternative, between 1.7 to 2.0 acres of aquatic habitat under the reconstructed Pier 54 would receive less than 1 hour of sunlight under conditions of the Spring/Fall, Summer, and Winter equinoxes, which are representative of intermediate, highest and lowest positions of the sun during the year. The No Action alternative would provide no opportunity to decrease shading of aquatic habitat within HRP and would result in substantially more shading of aquatic habitat (about 50 percent more) than the Proposed Project.

[1] USACE Permit No. 1998-00290, Special Condition G (April 4, 2005).

The No Action alternative would not meet the programmatic needs of the Proposed Project. It would provide less area for public access, less landscaping, and would not offer the flexibility needed to combine a diversity of performance environments with quality public open space. With the No Action alternative, the only performance configuration would be the in-line single rectangular stage and audience area with only one means of egress. Unlike the Proposed Project, the No Action alternative would not allow for multiple user experiences within the pier at the same time (e.g., attendance at a performance and passive recreational activities). Additionally, the No Action alternative would provide no resilience with respect to sea level rise. The No Action alternative would result in the reconstruction of Pier 54 at its current elevation (which is about 5 feet below the Preliminary FIRM 100-year flood AE Zone elevation of +13 Feet NAVD88). During a 100-year storm event, all hardscape, planting and critical infrastructure would be below the flood elevation, a situation that would worsen with projected increases in sea level in the 2080s of 58 inches. For these reasons, and the lack of opportunity to reduce shading of aquatic habitat due to overwater structure, the No Action alternative was not considered to fulfill the project's purpose and need and is therefore not practicable.

PROJECT DESIGN ALTERNATIVES

The Proposed Project was developed through an exploratory design process that considered alternatives to various aspects of the design, including those that would not result in a discharge of flowable concrete below MHW. These design alternatives, and the reasons they were not considered for further evaluation, are described below.

Smaller Pier Footprint

The Proposed Project is a 320-foot by 320-foot square pier with an overwater footprint of approximately 2.7 acres including the access ramps. The pier size was selected through an iterative design process that considered first a rectangular pier typical of the size and shape of others within Hudson River Park, similar to the original 1.9-acre Pier 54. Because the Trust historically hosted park events like movies and concerts for 5,000 attendees on Pier 54, any alternative pier design needed to be able to accommodate a crowd of at least this capacity. Additionally, unlike the No Build pier design, the Trust established the goals of 1) providing for a secondary means of egress during event conditions especially; 2) allowing for multiple user experiences within the pier at the same time (e.g., the separation of open space and programmed areas); and 3) providing for a diversity of performance environments (rather than the in-line single rectangular stage and audience area required by the typical rectangular pier configuration). The proposed pier size, while slightly larger than the original 1.9-acre Pier 54, was the minimum footprint that would allow for all of these goals to be achieved. For this reason, a pier smaller in size than the proposed 2.4-acre pier (excluding the access ramps) was not considered to fulfill the project's purpose and need and is therefore not practicable.

Alternative Pier Location

During the conceptual design process, an option was considered that would have located the pier further to the south, with a portion of the pier within the existing Pier 54 footprint. This option was rejected because it would have resulted in view corridor obstructions, would have been closer to a possible future Gansevoort Peninsula Marine Transfer Station, and would not have provided as desirable a connection to public from West 14th Street as the Proposed Project. For this reason, locating the pier closer to its existing footprint was not considered to fulfill the project's purpose and need and is therefore not practicable.

Alternative Pier Orientation

Alternative pier orientations were considered in the design process of the proposed pier, particularly with respect to the location of the high point of the pier. Among the goals of the project was to design the pier in such a way that most of it would be outside of the floodplain. Once the decision was made to elevate the pier, it became clear that by rotating the pier such that its high point was due south would cast less shadow on aquatic habitats of the Hudson River. Accordingly, even with a larger footprint, there would be little change in the incremental shadow on the river. For these reasons, an alternative pier orientation was not considered practicable.

Pile Support Bracing Design Alternative

As an alternative to the pile design of the Proposed Project where “pots” at the top of the 36-inch-diameter concrete piles support the landscaping, an alternative design was considered that supported the deck using curved pile caps on solid piles. This Pile Support Bracing Design Alternative would provide the same size and dimensions of the pier platform as the Proposed Project (a 320-by-320-foot platform). However, this alternative would use an alternative construction method of smaller 24-inch diameter solid pier support piles with curved pile caps to support the pier platform. A total of 629 piles would be required to support the weight of the proposed pier platform. To reinforce the piles to support the lateral loads of the pier, this alternative would require bracing of cross-members within the tidal zone in two directions. The volume of structure that would be placed within the Hudson River below MHW was estimated at about 5,400 CY. Because even this amount of bracing likely would not restrain the pier laterally, a slab spanning the bracing beams would also be required, creating a solid deck at mid-tide elevation.

This alternative would not have resulted in the placement of flowable concrete below MHW. However, this alternative would substantially increase the amount of structure below MHW which would have the potential for adversely affecting the water circulation pattern in the vicinity of the pier, would pose concerns with respect to constructability (use of precast members for the pier platform would not be an option; instead concrete would have to be cast in-place over the river), would be more costly than the Proposed Project, and would lengthen the in-water construction period. For all these reasons, it was not considered practicable.

Use of Solid 36-inch Diameter Pier Support Piles

The alternative of using a solid pile to support the pier, which would not have resulted in the discharge of flowable concrete below MHW to connect the “pots” to the piles, was evaluated as an alternative to the pile design of the Proposed Project. The allowable load limit for a 36-inch diameter pile is approximately 250 tons. To support the proposed pier structure, the piles must support a load that has 3 components: DL (dead load or the weight of the structure), SDL (superimposed dead load or the weight of soil, trees, pavement, etc), and LL (live load or the weight of people, vehicles, etc.). With solid piles, the DL would increase, approximately 30 tons per pile. Because there is a limit on the load that a pile can support, increase in the DL would have to be compensated by a decrease in some other load. Since the LL cannot be decreased, the SDL weight would have to be decreased. The main contributor to SDL is the weight of the horticultural soil. An average tree requires a minimum of 3 feet of soil depth to grow and thrive. Reducing this thickness would have required elimination of most trees on the pier. Additionally, the solid 36-inch diameter piles are heavier than hollow piles (almost double the weight) and subsequently are harder to lift and handle. This would result in the need for larger pile driving equipment, a slower pile installation pace, and an increase in the pile driving duration. For these reasons, this alternative was not considered practicable.

Alternative Without the Amphitheater Support Vessel

The amphitheater that would be developed as part of the Proposed Project would include theater-specific amenities including infrastructure to support lighting and sound equipment for performances. It would be served by a support area, which would provide an area where actors, scenery, and props could be located backstage; it would also provide storage for equipment needed to care for the park, such as lawn mowers and other landscaping tools. The amphitheater support area would be located within an interstitial space beneath a portion of the amphitheater and supported by a combination of piles and decking. The support area would be accessible from a ramp located toward the center of the pier; this ramp would also be used to meet Americans with Disabilities Act (ADA) requirements for theater audiences and actors. For a period not to exceed six month per year, a 4,000-sf vessel would moor along the northwestern edge of the pier, connecting to the interstitial space ramps. The vessel would provide additional support space (changing, shower and toilette facilities) required to meet the Actors Equity Association requirements for performances, allowing the pier to accommodate cultural programming while limiting the extent of permanent structures on the pier and maximizing usable green public space. Under this alternative, all of the additional support space that would be required to meet Actors Equity Association requirements would be provided on the surface of the pier, or accommodated as much as possible within the amphitheater support space. Providing the additional support space on the pier surface would require a 4,000-square-foot structure to be constructed on the main space of the pier, resulting in a permanent loss of open space area within the structure footprint, for an activity that would only occur during the performance season and may not occur at all in a given year. In addition to resulting in a loss of open space, such a structure would also compromise the visual integrity and beauty of the park as designed. Accommodating the additional amphitheater support space only within the undercroft area would limit the artistic programming to very small productions utilizing only a handful of professional actors or be forced to hire non-union actors in order to avoid compromising union regulations. This would result in producing work far below the highest standard demanded for this venue. For these reasons the alternative of not providing additional support by using an amphitheater support vessel was not considered practicable.

DESCRIPTION OF EXISTING AQUATIC HABITAT

SURFACE WATER RESOURCES IN THE PROJECT AREA

The site is located within the lower Hudson River Estuary, which is tidally influenced. Saltwater from Upper New York Bay enters the lower Hudson River Estuary during the flood stage of the tidal cycle and lower salinity water is discharged from the Estuary to the Bay during the ebb stage. Tidal flows are considerably larger than the range of freshwater flows. Currents are shore parallel and tidally influenced, with primary flows to the north during flood tide and to the south during ebb tide (Ocean Surveys, Inc. 1987). The average tidal current in the Hudson River is 0.7 meters per second (2.3 feet per second or 1.4 knots). Tidal currents in the middle of the channel and at the surface are stronger, averaging 1 meter per second (3.3 feet per second, or 2 knots) (Geyer and Chant 2006).

The salinity of the lower Hudson River Estuary varies daily with the tidal cycle and seasonally with the volume of freshwater entering from upriver. Freshwater and higher salinity waters are well mixed during low-flow conditions but are stratified under high-flow conditions when the freshwater overrides the saltwater layer (Moran and Limburg 1986). The lower Hudson River Estuary is classified as polyhaline (18 to 30 parts per thousand (ppt)) in late summer and autumn, and mesohaline (5 to 18 ppt) in spring and early summer (Ristich et al. 1977).

Within the project site, water depths at MLW range from less than 4 feet at the bulkheaded shoreline, to between 5 and 10 feet north and south of the existing Pier 54, and over 20 feet near the U.S. Pierhead line.

WATER QUALITY

The water quality of the lower Hudson River Estuary is strongly affected by human activity upstream and the densely populated and industrialized land uses that surround it. Historically, water quality problems included low dissolved oxygen (DO) content, high nutrient concentrations, algal blooms, excessive numbers of coliform bacteria, and the presence of floatables contributed to water quality impairment. However, the construction and upgrading of water pollution control plants (WPCP), and implementation of water pollution control programs throughout New York has greatly reduced nutrient inputs and improved water quality (Brosnan and O'Shea 1995). Part 701 of Title 6 of the Codes, Rules and Regulations of the State of New York 1974 (6NYCRR), as amended in 1987, indicates the best usages for Class I saline surface waters as secondary contact recreation and fishing, and as suitable for fish propagation and survival.

The New York Harbor (NYH) Water Quality Survey (NYCDEP 2012, 2013) provides data from a series of thirteen monitoring stations situated within the Inner Harbor Area of the lower Hudson River from the Westchester county line to the Battery, including the East River and Kill Van Kull-Arthur Kill system. The NYH Report indicates that all of these stations meet the water quality standards but are prone to short-lived increases in fecal coliform loading after storm events. The closest water-quality station to the project area is Station N4, which is located upstream of Pier 54 at West 42nd Street.

The NYCDEP monitors coliform bacteria as an indicator of sewage-related pollution. Primary sources of coliform bacteria include CSOs during and immediately after rain events, illegal sewage connections to CSOs, occasional unplanned bypasses in the sewer system due to equipment malfunction; permitted dry weather bypasses due to construction and upgrading WPCP effluent, stormwater, and boat discharges. Disinfected WPCP effluent contributes less than 1 percent of the total coliform load to the New York Harbor. Coliform measurements taken at station N4 between 2009 and 2013 ranged from 4 to 4,000 cells/100 mL in surface waters.[1]

Salinity measurements taken between 2009 and 2013 ranged from 0.2 to 23.9 practical salinity units (psu) in surface waters and 0.2 to 27.3 psu in bottom waters, and averaged 13.7 and 22.5 psu, respectively (NYCDEP 2014).

Dissolved oxygen (DO) in the water column is necessary for respiration by aquatic biota. Persistently low DO can degrade habitat and affect aquatic biota. Consequently, DO is one of the most universal indicators of overall water quality in aquatic systems. During the 5-year period from 2009 to 2013, DO concentrations ranged from 0.7 to 14.7 mg/L at the surface and from 0.6 to 12.0 mg/L at the bottom and averaged 6.9 mg/L and 5.8 mg/L, respectively.

[1] Compliance with the fecal coliform standard of 2,000 cells/100 mL is based on a monthly geometric mean (for which the data are not available to calculate) and not on the basis of the high fecal coliform value presented here which is the maximum fecal coliform value obtained during weekly sampling events. This maximum value occurred in 2011, a year characterized by higher than usual precipitation; geometric means during this year still met the fecal coliform standard (NYCDEP 2012).

High levels of nutrients can lead to excessive plant growth (a sign of eutrophication) and depletion of DO. Concentrations of the plant pigment chlorophyll-*a* in water can be used to estimate productivity and the abundance of phytoplankton. Chlorophyll-*a* concentrations greater than 20 µg/L are considered suggestive of eutrophic conditions (NYCDEP 2012). From 2009-2013, chlorophyll-*a* concentrations ranged from 0.3 to 22.2 µg/L at the surface and averaged 4.0 µg/L. Ninety-eight percent of chlorophyll-*a* concentrations were below 20 µg/L during this time period (NYCDEP 2014).

Secchi transparency is a measure of the clarity of surface waters. Transparency greater than 5 feet (1.5 meters) indicates relatively clear water. Decreased clarity can be caused by high suspended solid concentrations or blooms of plankton. Secchi transparencies less than 3 feet (0.9 meters) may be considered indicative of poor water quality conditions. Transparency records for the Inner Harbor Area indicate that sunlight penetrates to an average of 5 feet. However, Secchi transparency readings taken just upstream of the project area at station N4 ranged from 0.5 to 5.0 feet and averaged 2.1 feet during the five-year period from 2009-2013 (NYCDEP 2014). Due to limited light penetration, the littoral zone in this area does not support submerged aquatic vegetation (SAV) (Olson et al. 1996).

Suspended sediments vary with season and weather—near bottom concentrations range between 100 and 200 mg/L in summer, 100 to 400 mg/L during high discharge periods, and greater than 800 mg/L at times of maximum flow. Sedimentation in the lower Hudson River is greatest in the shallows on the west side of the river (Geyer 1995). Mean sedimentation rate for the portion of the estuary north of Pier 54, at Pier 76, has been estimated at 4.1 inches/year, with higher sedimentation rates occurring in the underpier areas than in the interpier areas (EEA 1988).

SEDIMENT QUALITY

Complex flow patterns lead to widely variable sediment characteristics throughout the area. The primary constituents of Hudson River sediments are silt and clay (USACE 1999, EEA 1988). Typical of any urban watershed, New York Harbor Estuary sediments are contaminated due to a history of industrial uses in the area. Contaminants found throughout the New York Harbor Estuary include pesticides such as chlordane and DDT, metals such as mercury, cadmium, lead, and copper, PCBs and various polycyclic aromatic hydrocarbons (Rohmann and Lilienthal 1987). Adams et al. (1998) found the mean sediment contaminant concentration for 50 of 59 chemicals measured in sediment samples from the New York/New Jersey Harbor Estuary to be statistically higher than other coastal areas on the East Coast. Biological effects, identified based upon the benthic invertebrate community, were found to be associated with chemical contamination. While the sediments of the New York Harbor Estuary are contaminated, the levels of most sediment contaminants (e.g., dioxin, DDT, and mercury) have decreased on average by an order of magnitude over the past 30 years (Steinberg et al. 2002). Between 1993 and 1998, the percentage of sediment sampling locations with benthic macroinvertebrate communities considered impacted, or of degraded quality, decreased throughout the New York/New Jersey Harbor Estuary (Steinberg et al. 2004).

C. EFH DESIGNATIONS

Pier 54 is within a portion of the Hudson River estuary EFH that is situated in the NOAA/NMFS 10' x 10' square with coordinates (North) 40°50.0' N, (East) 74°00.0' W, (South) 40°40.0' N, (West) 74°10.0' W. This square includes the following waters: the Hudson River and Bay from Guttenberg, NJ south to Jersey City, NJ, including the Global Marine Terminal and the Military

Ocean Terminal, Bayonne, NJ, Hoboken, NJ, Weehawken, NJ, Union City, NJ, Ellis Island, Liberty Island, Governors Island, the tip of Red Hook Point on the west tip of Brooklyn, NY, and Newark Bay. **Table 2** lists the species and life stages of fish identified as having EFH in the portion of the Hudson River near the project site. EFH habitat was identified for smooth dogfish in the immediate vicinity of Pier 54 (NOAA 2015).

Table 2
Essential Fish Habitat Designated Species in the Vicinity of Pier 54

Species	Eggs	Larvae	Juveniles	Adults
Red hake (*Urophycis chuss*)		x	x	x
Winter flounder (*Pseudopleuronectes americanus*)	x	x	x	x
Windowpane flounder (*Scophthalmus aquosus*)	x	x	x	x
Atlantic herring (*Clupea harengus*)		x	x	x
Bluefish (*Pomatomus saltatrix*)			x	x
Atlantic butterfish (*Peprilus triacanthus*)		x	x	x
Atlantic mackerel (*Scomber scombrus*)			x	x
Summer flounder (*Paralichthys dentatus*)		x	x	x
Scup (*Stenotomus chrysops*)	x	x	x	
Black sea bass (*Centropristis striata*)	n/a		x	x
King mackerel (*Scomberomorus cavalla*)	x	x	x	x
Spanish mackerel (*Scomberomorus maculatus*)	x	x	x	x
Cobia (*Rachycentron canadum*)	x	x	x	x
Clearnose skate (*Raja eglanteria*)			x	x
Little skate (*Leucoraja erinacea*)			x	x
Winter skate (*Leucoraja ocellata*)			x	x
Bluefin tuna (*Thunnus thynnus*)	x	x	x	x
Smooth dogfish (*Mustelus canis*)	x	x	x	x
Sand tiger shark (*Odontaspis taurus*)		x(1)		
Dusky shark (*Carcharinus obscurus*)		x(1)		
Sandbar shark (*Carcharinus plumbeus*)		x(1)		x

Notes:
n/a – insufficient data for this lifestage exists and no EFH designation has been made.
(1) Neither of these species have a free-swimming larval stage; rather they are live bearers that give birth to fully formed juveniles. For the purposes of this table, "larvae" for sand tiger, dusky, and sandbar sharks refers to neonates and early juveniles.
Source:
National Marine Fisheries Service. "Summary of Essential Fish Habitat (EFH) Designation" posted on the Internet at http://www.nero.noaa.gov/hcd/STATES4/new_jersey/40407400.html and http://www.nero.noaa.gov/hcd/skateefhmaps.htm
National Marine Fisheries Service EFH Mapper accessed online at http://www.habitat.noaa.gov/protection/efh/habitatmapper.html

D. POTENTIAL IMPACTS TO EFH

GENERAL DISCUSSION OF POTENTIAL AQUATIC IMPACTS FROM THE PROPOSED PROJECT

WATER QUALITY

Construction

In-water construction activities for the Proposed Project relating to pile driving would occur outside the November 1 to April 30 window in which pile driving is prohibited as a condition in the NYSDEC and USACE permits issued for the development of Hudson River Park. Pile driving activities would be completed within two pile driving seasons.

Sediment-disturbing activities associated with the Proposed Project include pile driving, selective removal of 25 existing piles that would interfere with installation of new piles, and movement of tugs to position the construction barges. In order to minimize resuspension of bottom sediment, tug movement in areas where water depths would not be sufficient to allow a clearance of at least 2 to 3 feet between the propeller(s) and the bottom sediment would be limited to the extent possible.

All in-water and shoreline construction work would be done using barge-based crews. Each crew would have an approximately 60-by-180-foot crane barge with impact hammer to drive the piles, and the same size material barge. The barges would not remain at a single location for more than a few days. Consistent with the NYSDEC and USACE permits for in-water work within Hudson River Park, floating debris screens would be in place throughout construction activities. Erosion and sediment control measures (e.g., straw bale erosion) would be in place during all soil placement and landscaping activities on the pier to minimize potential increases in suspended sediment within the Hudson River due to discharge of soil material to the Hudson River during construction of the Proposed Project.

Sediment disturbance associated with the pile driving will be minimal but if it should occur would have the potential to result in minor, short-term increases in suspended sediment and resuspension and re-deposition of contaminants. Increases in suspended sediment due to pile driving would be temporary and localized, confined to the immediate vicinity of construction activities. The average tidal current in the Hudson River is 1.4 knots (Geyer and Chant 2006). Therefore, any sediment resuspended during pile driving would move away from the area of in-water construction and would dissipate shortly after the completion of pile driving activity. Additionally, the temporary localized increases in suspended sediment during pile driving would be intermittent, occurring during the 15-minute period anticipated for the driving of each new pile followed by a period of no sediment disturbing activity while the next pile is being prepared for installation. Therefore, in-water construction activities due to the Proposed Project would not result in significant adverse impacts to water quality. Similarly, any contaminants released to the water column as a result of sediment disturbance would dissipate rapidly and would not result in significant adverse long-term impacts to water quality.

Operation

The spacing of the 264 piles for the main platform of the Proposed Project (about 20 feet on center) would not result in a significant adverse effect to the movement of tidal waters or the DEC-designated use classification of the Hudson River within the project area.

Measures have been incorporated into the design of the pier to minimize the discharge of soil and planting material from the pier to the Hudson River, and to ensure that the quality of stormwater discharged from the Proposed Project will not adversely affect Hudson River water quality and aquatic biota.

Measures incorporated into the Proposed Project to minimize discharge of soil and planting material to the Hudson River include the following:

- Soils placed on the pier will be manufactured using locally available sand and compost to achieve a well-drained, stable medium that will be resistant to compaction and erosion.
- Slopes will be stabilized, taking into consideration slope angle and anticipated foot traffic. On slopes up to 30 degrees, stabilization would rely on plant roots and mulch. On slopes greater than 30 degrees, slopes will be stabilized through a combination of geofibers and densely rooted shrubs and ground covers.
- Plant materials planted on the pier will be selected for their suitability for the anticipated conditions, which will include salinity from salt spray, winds, solar exposure and human use.
- A stormwater drainage system has been incorporated into the pier design to convey runoff from the impervious and pervious surfaces to ensure that the landscaped sloped areas drain and maintain slope stability.

Measures to ensure that the runoff generated on the proposed pier will not adversely affect water quality and aquatic biota of the Hudson River are as follows:

- Soil fertility will be maintained primarily through periodic replenishment of compost. Soil testing will be conducted to monitor health of soils. Only slow-release fertilizer will be used and that will only be done sparingly and confined to lawn areas only. No pre-emergent herbicides will be used.
- As with other portions of HRP and required as part of the Hudson River Park Estuarine Management Plan, landscape and turf will be maintained using Integrated Pest Management techniques, thereby eliminating use of pesticides.
- Vegetation and soil will slow the rate of stormwater discharge from the pier and filter stormwater. Precipitation falling on planted areas will be filtered through plant roots and through the sand-based soil medium, improving the quality of the stormwater prior to discharge.
- Irrigation within turf areas will utilize spray heads while irrigation within steep slopes and shrub/ground cover areas will utilize a drip system.
- As presented in the Hudson River Park Estuarine Management Plan, litter control is one of the Preservation and Protection Objectives of the Estuarine Sanctuary Action Plan. The HRPT has developed a Litter Debris Plan and litter control is a requirement for provision within Park leases and permits.

AQUATIC BIOTA

Construction

The in-water construction activities described above under "Water Quality," have the potential to result in temporary adverse impacts to fish and macroinvertebrates due to the following:

- Temporary increases in suspended sediment;
- Loss of benthic habitat within pile footprints; and
- Other impacts associated with pile driving.

In-water pile driving for the Proposed Project would be conducted using barge-based pile driving equipment positioned at the work site with tug boats. The duration of pile driving would be two seasons, each approximately 6 months. Typically, up to three 36 inch piles, six 24 inch piles, or some combination of the two would be driven per day, with the duration of pile driving with the impact hammer to seat the piles into bedrock of about 15 minutes per pile.

Temporary Increases in Suspended Sediment

There would be no dredging or other disturbance of bottom habitat or open water habitat other than the minimal resuspension that would occur during removal of 25 existing piles and driving of the piles for the new pier, access ramps, and fender piles.

The project site is strongly influenced by the tidal currents of Hudson River. As discussed above under "Water Quality," any temporary increase in suspended sediment associated with pile driving would be localized and would dissipate shortly after the completion of the sediment disturbing activity. Tidal currents would dissipate any resuspended sediments such that redeposition within or outside the project area would not adversely affect benthic macroinvertebrates or bottom fish.

Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates generally are tolerant of elevated suspended sediment concentrations and have evolved behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions such as increases in suspended sediment and noise. Any sediment suspension during in-water work would be temporary, minimal, and localized, and would be well below physiological impact thresholds of adult and larval fish and benthic macroinvertebrates. Additionally, because fish are mobile and generally avoid unsuitable conditions in the field, such as large increases in suspended sediment and noise (Clarke and Wilber 2000), the effects of habitat avoidance would not significantly affect their condition, fitness, or survival. Fish also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. Mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans exposed to suspended sediments for up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000), which would not occur from the in-water work associated with the Proposed Project. Pile driving is an intermittent activity and would therefore have limited effect on suspended sediment concentrations within any given location during the duration of construction. As discussed above and in the FEIS for the Hudson River Park, resuspension of bottom sediment during pile driving within the Hudson River Park would be temporary and of short duration.

Other Potential Impacts Associated with Pile Driving

Pile driving would utilize a diesel impact hammer with a cushion block to protect the pile from damage and to minimize underwater noise during driving.[1] Pile driving with impact hammers can generate underwater sound pressure waves that may adversely affect fish (CalTrans 2001; Hawkins and Popper 2014). Because the Proposed Project would only require short periods of driving (i.e., no more than 90 minutes per day assuming less than 15 minutes per pile with up to 6 piles driven per day), these activities would not result in significant adverse impacts to fish within the lower Hudson River, even if occurring concurrently with pile driving conducted at Pier 57. At Pier 57, most of the piles to be installed are 18-inch diameter along the edge of the pier (250 piles). An additional 40 24 by 24 inch precast concrete piles will be installed for the bulkhead and perimeter walkway extensions. Because the piles for that project do not need as much weight bearing capacity as the Proposed Project, installation of piles would use a combination of allowing piles to sink deep into the sediment under their own self weight, and driving with an impact or vibratory hammer as needed. Pier 57 pile driving with an impact hammer would be minimized to the greatest extent possible, and would be at least 50 feet away from pile driving that would occur for the Proposed Project, with much of the pile driving for Pier 57 at least 100 feet away from the Proposed Project. Should pile driving for the Proposed Project and Pier 57, or other in-water activities associated with the construction of the Proposed

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[1] Although NMFS typically recommends the use of vibratory hammers as a BMP for minimizing underwater noise levels during pile driving, the vibratory hammer is not used for concrete piles because this installation method causes damage to concrete piles. Therefore, this BMP is not an option for driving concrete piles for this project.

Project, cause fish to avoid portions of the Hudson River in the vicinity of the project site during the brief periods of pile driving for both projects, the extent of the area that would be affected at any one time is likely to be small, when compared with the suitable habitat that would still be available within the lower Hudson River. To further reduce the likelihood of impacts to the fish community, pile driving for Pier 57 and the Proposed Project would not occur during the November to April period when winter flounder and striped bass are found in higher densities in overwintering habitat within the New York Harbor than other months.

Loss of Benthic Habitat

The installation of new piles would result in the permanent loss of approximately 2,502 square feet (0.06 acres) of benthic habitat and benthic macroinvertebrates located within the footprint of the piles that are unable to move from the area of disturbance.

The loss of benthic macroinvertebrates within the pile footprints would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish.

In summary, during construction of the in-water project elements and pile driving activities, the temporary and localized increases in suspended sediment and alterations to bottom habitat, benthic macroinvertebrates, and water column habitat would not result in any significant adverse impacts to aquatic biota of the Hudson River. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect aquatic biota due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects.

Operation

As discussed above under “Water Quality,” the operation of Pier 54 would not result in significant adverse impacts to water quality, and, therefore, would not result in significant adverse impacts to fish or benthic macroinvertebrates. Some of the piles that would be installed as part of the Proposed Project may provide suitable refuge to fish, and the pile spacing that would result from the Proposed Project would not result in significant adverse effects to tidal movement and possible effect on water quality and aquatic habitat.

With the Proposed Project, the piles supporting the existing Pier 54 deck would be retained, creating approximately 84,300 square feet (1.94 acres) of pile field habitat within the study area. The establishment of the Pier 54 pile field would provide additional, structured habitat for fish species, such as striped bass, black sea bass, winter flounder, and marine invertebrates including marine worms (oligochaetes/polychaetes), amphipods, barnacles and other Crustacea, as well as increased abundance of primary producers due to the increased light exposure, such as phytoplankton and benthic microalgae. Pile fields have been found to be preferred habitat for diverse number of fish species in the Harbor Estuary (Able et al. 1998). Fish preferentially spend time in pile field and open water habitats compared to under pier habitats. Able et al. (1998) observed that young-of-year fish abundance and species richness were higher in pile field and open water habitats than under large piers in the lower Hudson River. Growth rates for fish were also found to be higher in pile field and open water habitats than in habitats found under large piers (Able, Manderson, and Studholme 1999). Juvenile fish have also been observed to spend more time near wrecks, pier fields, and open water than under piers (Duffy-Anderson, Manderson, and Able 2003). Therefore, the establishment of this pile field would result in benefits to the fish community in the project and adjacent areas.

The Proposed Project would include nighttime lighting on top of the pier for event and general operation, and underpier architectural lighting of the pots that would support the pier. Nighttime artificial lighting has been found to both attract fish (e.g., Juell and Fosseidengen 2004, Marchesan et al. 2005, Martins and Perez 2006, McConnel et al. 2010) and cause fish to avoid lighted areas (Contor and Griffeth 1995, Van Aanholt et al. 1998, Schmidt et al. 2009), depending on the species of fish and the color, intensity, type, and duration of the light. The avoidance of artificial lighting by some species and attraction of others in turn affects fish community composition, feeding behavior (Mazur and Beauchamp 2006), schooling behavior (Johansson et al. 2006), migratory movement patterns (Tabor et al. 2001, Riley et al. 2013), and predator-prey dynamics (Scheuerell and Schindler 2003, Becker et al. 2013). Artificial lighting has also been observed to impede spawning (Woodhead 1966) and increase stress hormones in some fish (Migaud et al. 2007).

The site of Pier 54 and the lower Hudson River in general is in a highly urbanized environment and subjected to extensive amounts of nighttime artificial lighting. Under existing conditions, the area of river around Pier 54 receives direct or indirect nighttime lighting from numerous sources including nearby buildings, street lights, and automobile headlights, in addition to light coming from similar sources across the river in New Jersey. The Proposed Project would use computerized lighting controls to minimize any incremental increase in lighting from the Proposed Project. These controls would:

- not allow direct beam from architectural lighting into the water;
- allow for lights to be turned off or dimmed periodically;
- automatically turn lights off when the pier is not in use;
- maintain a dark “rest” period every night; and
- use directional, shielded lighting that would minimize any spill beyond the pier.

With these measures in place the Proposed Project would not result in significant adverse impacts to aquatic habitat or aquatic biota within the study area due to nighttime lighting.

Shading

The new Pier 54 would consist of a 320-foot by 320-foot platform for an overall pier surface area of approximately 2.4 acres. To reach the new pier from the mainland, two access ramps would be constructed: the northern access ramp would have an overall surface area of approximately 0.1 acres, and the southern access ramp would have an overall surface area of approximately 0.2 acres. Compared to the No Action pier 54 structure, the construction of the new pier and access ramps would result in a net increase of overwater structure of approximately 0.8 acres. However, unlike the No Action pier that would be constructed immediately above the water surface, the proposed pier would be elevated above the water surface, introducing more sunlight under the pier than under the No Action condition, as discussed below.

NYSDEC usually considers aquatic habitat under an overwater structure to be shade-impacted beyond 15 feet inward from the structure’s edges. This is consistent with recent studies that found shading from Hudson River piers to affect the behavior and abundance of fishes under the pier, approximately 15 or more feet from the nearest pier edge (Able and Grouthues 2011; Able et al. 2013). Shading from piers in the Hudson River has also been found to influence fish community composition, feeding activity, and growth rates (e.g., Able and Duffy-Anderson 2006; Duffy-Anderson and Able 1999).

The two access ramps would be no wider than 28 feet and would not result in significant adverse impacts to aquatic habitat due to shading. Similarly, the up to 4,000-square-foot (0.09 acres) vessel moored in the vicinity of the amphitheater to provide additional support facilities during the 6-month performance season, representing the maximum vessel size and duration of mooring that would occur for the Proposed Project, would be separated from the mooring walkway by a distance of approximately 4 feet, and would allow light to penetrate below the vessel during the day. Therefore, the temporary mooring of the vessel would not result in significant adverse impacts to aquatic habitat due to shading. The increased elevation of the Proposed Project would result in considerably less shading when compared to the No Action pier. Unlike the No Action pier, which would be almost level with the water surface, direct sunlight would reach under portions of the elevated proposed pier, particularly during early morning and late afternoon in all seasons when the sun is closer to the horizon, and for much of the day in winter when the arc of the sun is lower in the sky.

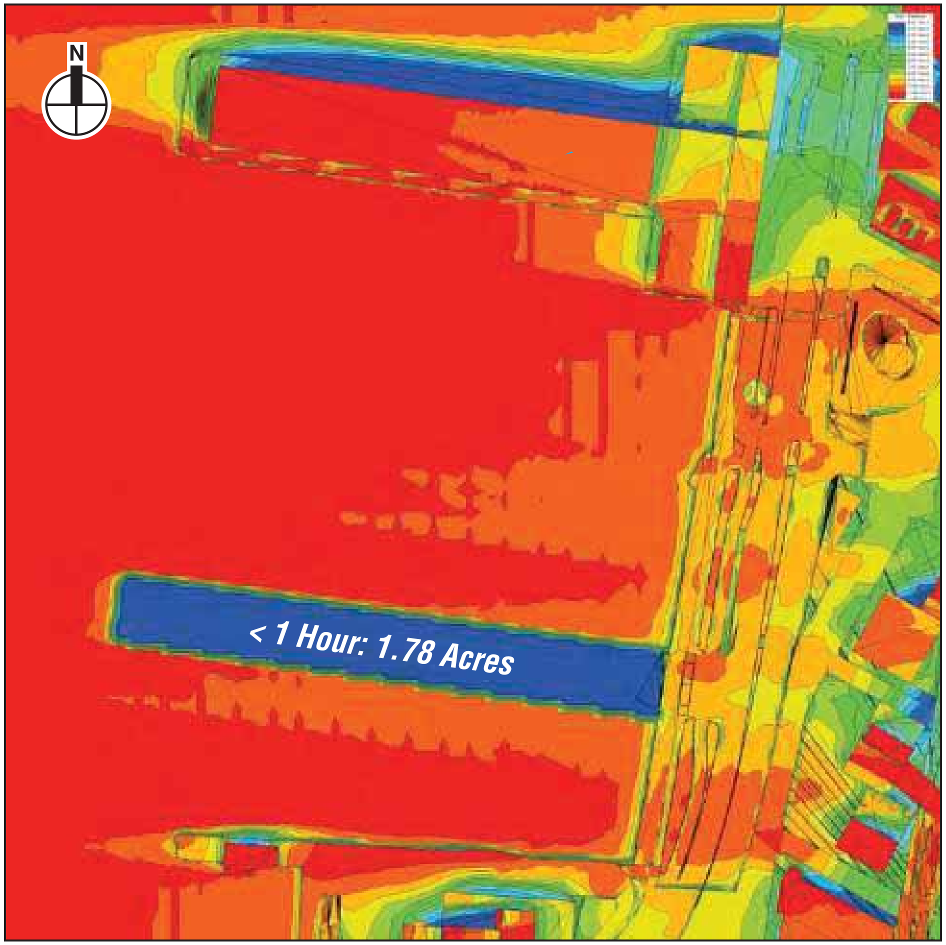
Using shade modeling software, which provides a conservative estimate of the extent and duration of shadows for existing and proposed structures, the area of the proposed pier and No Action pier that would receive only one hour or less of sunlight (i.e. the most shaded area modelled or “full-shade”) was projected for the Spring/Fall (March 21/September 21), Summer (June 21), and Winter (December 21) equinoxes (see **Figures 3 through 5**). These positions of the sun represent the intermediate, highest and lowest positions of the sun during the year, respectively. As indicated in **Figures 3 through 5**, the proposed pier would result in substantially less shading of aquatic habitat (decrease of between 50 to 51 percent) than the No Action pier. Therefore, due to the proposed pier’s higher and variable elevation above the water surface, the Proposed Project would realize a substantial improvement (reduction) in the quantity of Hudson River aquatic habitat in full shade. Areas of new shadow due to the rolling topography of the Proposed Project would move over the course of the day, not falling on one particular area for long. The current flows swiftly in the Hudson River and would move phytoplankton and other natural elements quickly through the shaded areas. The areas of the river that would receive the longest durations of new shadows would continue to receive ample sunlight in the midday and afternoon, because there are no intervening structures to the west. Therefore, given their limited duration and extent, incremental shadows generated by the Proposed Project would not have significant adverse impacts on aquatic resources of the Hudson River.

The 1998 FEIS for the overall Hudson River Park determined that the park would not result in a net increase in platform area over water. The 0.8-acre increase in overwater coverage resulting from the Proposed Project would be within the amount of overwater coverage authorized by the USACE and NYSDEC permits for this segment of the Hudson River Park.

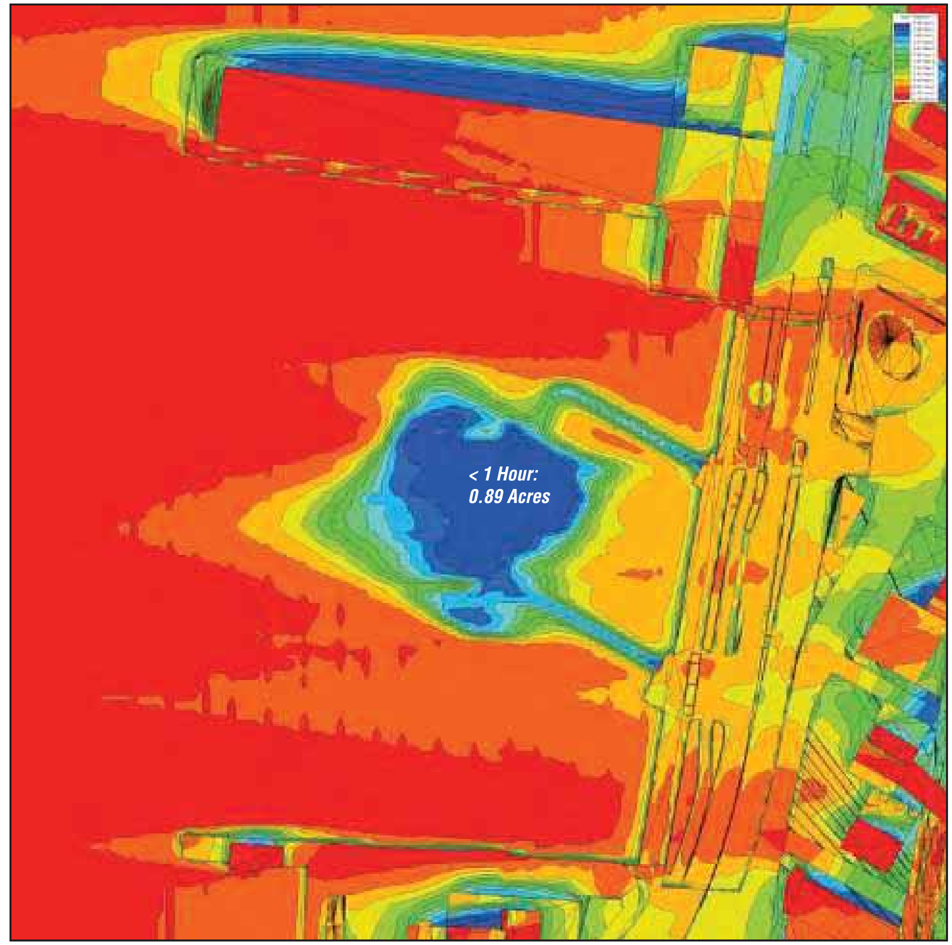
In summary, the operation of the redeveloped pier would not result in significant adverse impacts to water quality, aquatic habitat, or aquatic biota and therefore would not result in significant adverse impacts to the suitability of the project site for fish species identified by NMFS as having EFH in the lower Hudson River Estuary.

ASSESSMENT OF EFH SPECIES

An analysis of EFH for each fish species and life stage listed in **Table 2**—including the likelihood that the species would occupy the project area—and is summarized below. Much of the habitat and life history information presented in this assessment was obtained from the NMFS EFH Source Documents for most species. The source of additional information not provided in the EFH Source Documents is cited appropriately.



No Action Condition



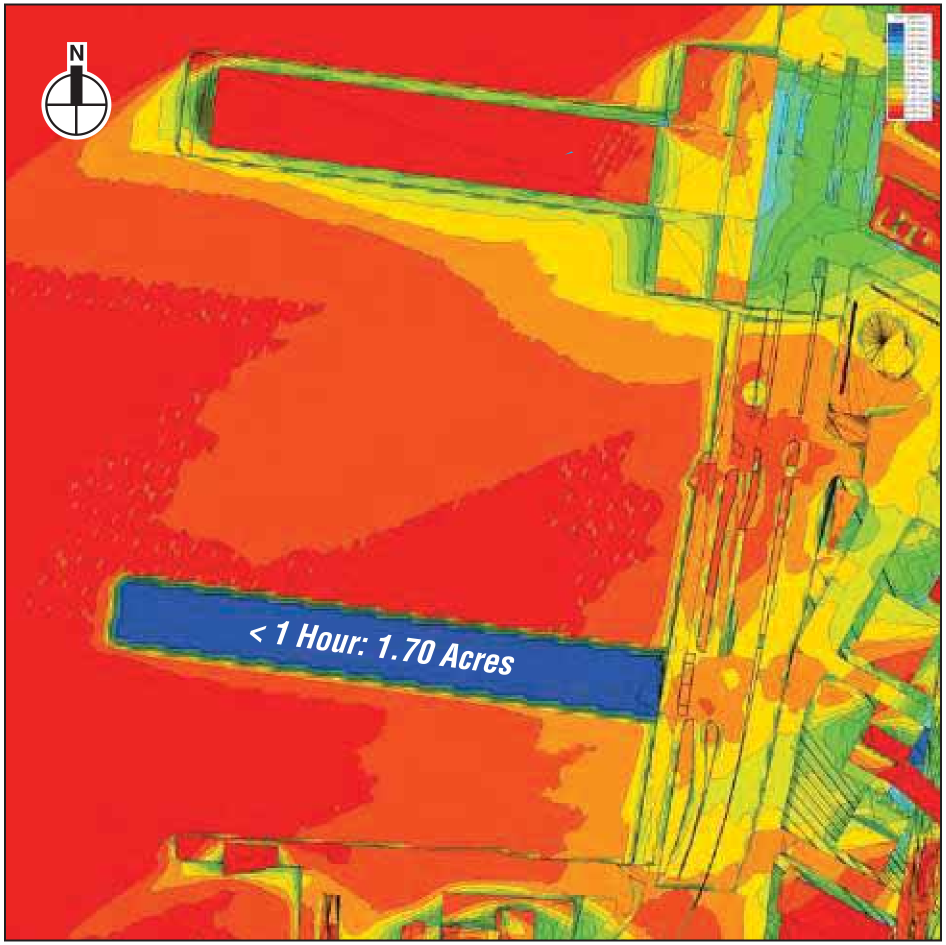
With Action Condition

Solar: Exposure
0.00 Hours
1.00 Hours
2.00 Hours
3.00 Hours
4.00 Hours
5.00 Hours
6.00 Hours
7.00 Hours
8.00 Hours
9.00 Hours
10.00 Hours
11.00 Hours
11.98 Hours

Note: Acreage measurements are approximate.

March 21 / September 21
Figure 3

2.4.15



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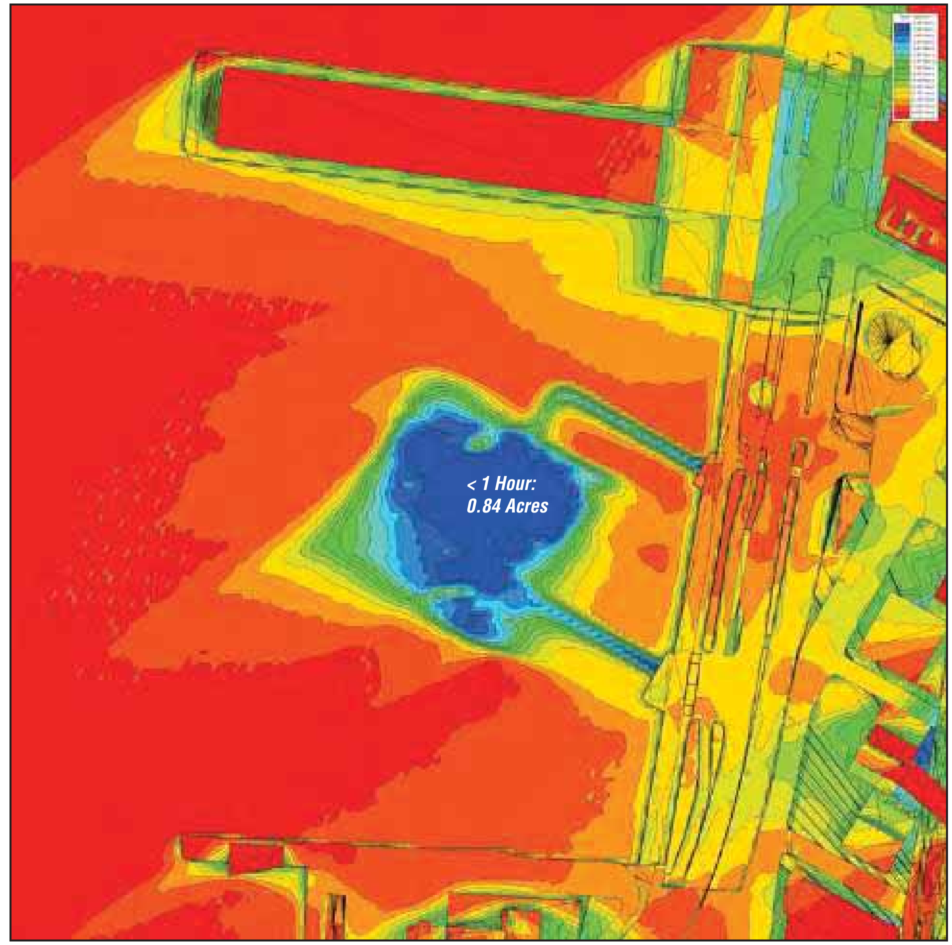
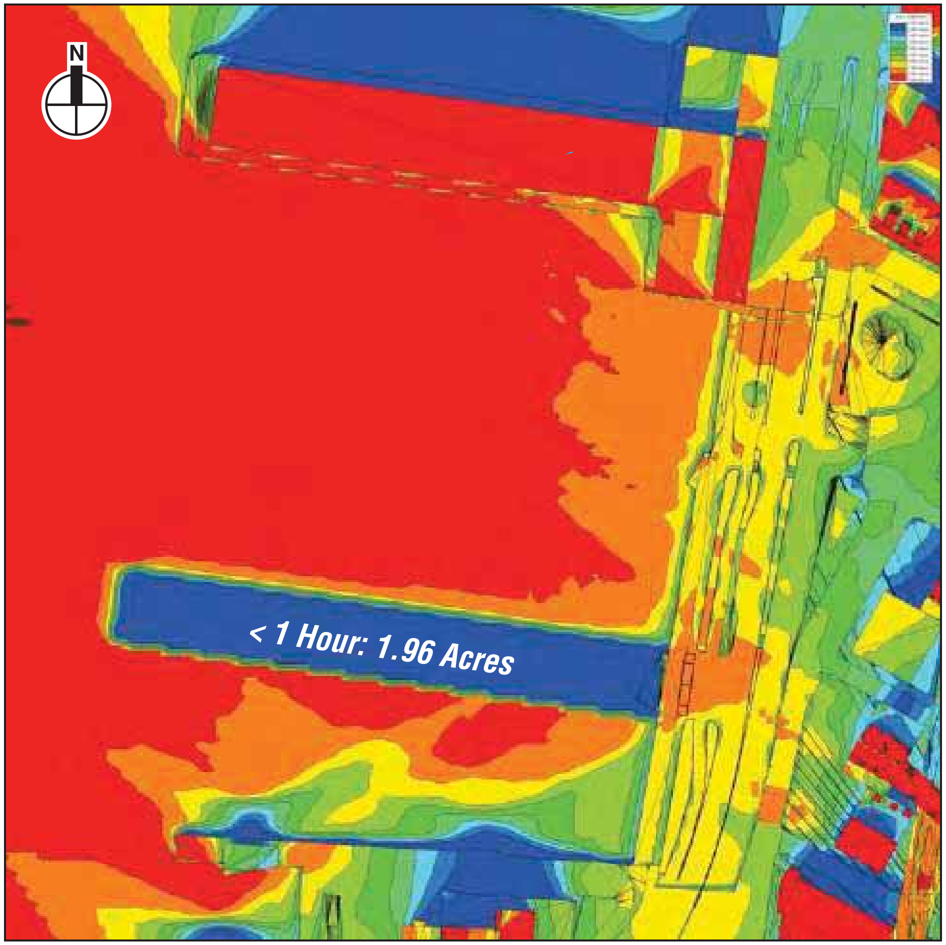


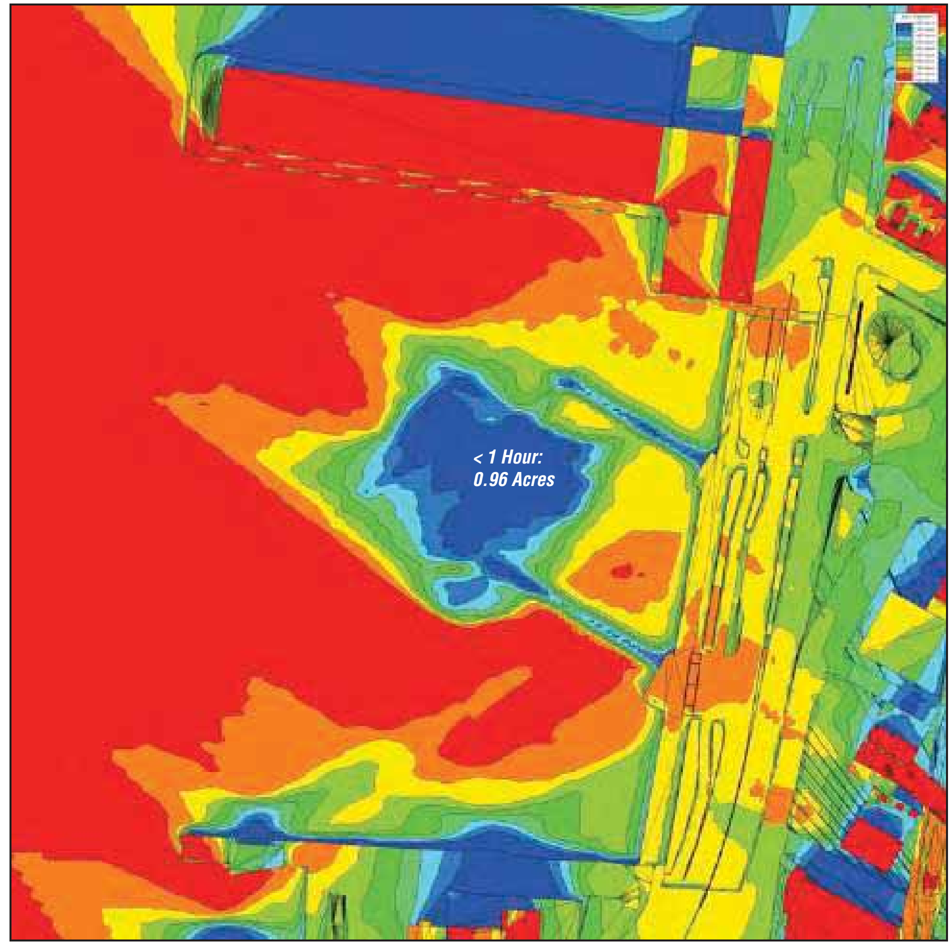
With Action Condition

Note: Acreage measurements are approximate.

June 21
Figure 4



No Action Condition



With Action Condition

Note: Acreage measurements are approximate.

December 21

Figure 5

Atlantic Butterfish (*Peprilus triacanthus*)

Butterfish occur from Newfoundland to Florida and are most abundant between southern New England and Cape Hatteras. It has been suggested that two populations of butterfish exist. One population appears largely restricted to shoals (less than 20 m [66 feet]) south of Cape Hatteras, and another mainly north of Hatteras that occurs in shoals and possibly some deeper waters along of the shelf. Throughout their range, butterfish are found over the entire shelf, inshore and offshore. The Hudson River within the vicinity of the project site is within an area designated as EFH for larval, juvenile, and adult butterfish. Butterfish stock is not currently considered to be overfished and overfishing is not occurring (NMFS 2014a, 2014b).

Adult butterfish can range from 120 to 305 mm (4.7 to 12 inches) in length. Both juveniles and adults are found in similar habitats. Both are eurythermal and euryhaline and are often common near the surface in sheltered bays and estuaries during the spring to autumn months. In the Hudson-Raritan trawl survey, juveniles and adults were found at depths from 3 to 23 m (10 to 75 feet), salinities from 19 to 32 ppt, and dissolved oxygen from 3 to 10 mg/L. Juvenile and adult butterfish also often prefer sandy and muddy substrates, and temperatures from 3 to 28°C (37 to 82°F) (Cross et al. 1999).

Juvenile and adult butterfish are planktivorous, foraging in the water-column and do not rely directly on benthic food sources.

Butterfish spawn from June to August in coastal waters but spawning adults have also been collected in inshore waters of bays and estuaries generally less than 30 m (98 feet) deep. Peak egg production is in late June and early July off Long Island Sound. Newly hatched larvae are between 2 and 16 mm (0.1 to 0.6 inches) in length. Larvae are found at the surface or in the shelter of the tentacles of large jellyfish, and are more nektonic (free swimming) than planktonic (drifting with water movements) when between 10 and 15 mm (0.4 to 0.6 inches) in length. Larvae are found at temperatures ranging from 7 to 26°C (45 to 79°F), although most abundant at 9 to 19°C (48 to 66°F), and at depths from 10 m to 120 m (33 feet to 394 feet) (Cross et al. 1999). At 6 mm (0.24 inches) larval body depth has increased substantially in proportion to length and at 15 mm (0.6 inches) the fins are differentiated and the young fish takes on the general appearance of the adult.

Young-of-the-year (juvenile) butterfish typically occur in loose schools near the water's surface and are also often found in association with floating structure and within the tentacles of jellyfish.

Juvenile and adult butterfish have the potential to occur occasionally within the project area. Although butterfish comprised less than 1% of the fish collected in the Hudson-Raritan Estuary (USACE 2000), Woodhead (1990) reported butterfish to be a common transient in the New York Harbor during the summer, and Bain et al. (2006) collected butterfish within the Hudson River Park between June 2002 and June 2004. Able et al. (1998) also collected Atlantic butterfish in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October 1993 and 1994. Atlantic butterfish prefer sandy bottoms but are not closely associated with the bottom when inshore during the summer. They may stay close to the bottom during the day and move upward at night (Smith 1985). Cooling temperatures associated with late autumn trigger an offshore migration to the edge of the shelf where waters are warmer. Butterfish require a minimum water temperature of 10°C (50ºF) for survival.

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to Atlantic butterfish, which are not directly dependent on benthic habitats for food or refuge. Spawning usually occurs in deeper waters on the continental shelf, but may also occur in the surface waters of coastal estuaries. Given the short duration and small spatial extent of construction within the project site, spawning would not be disrupted. Nursery habitat for this species is typically characterized as open water and often in association with floating debris and jellyfish at the water's surface; young-of-the-year fish are not directly associated with benthic habitats. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Atlantic Sea Herring (*Clupea harengus*)

Atlantic herring is a marine species that occurs throughout the Northwestern Atlantic waters from Greenland to North Carolina. They are most abundant north of Cape Cod and relatively scarce in waters south of New Jersey (USACE 2000). Juvenile and adult herring undergo complex north-south migrations and inshore-offshore migration for feeding, spawning, and overwintering. The Hudson River within the vicinity of the project site is within an area designated as EFH for larval, juvenile, and adult Atlantic herring. The Atlantic herring stock complex in the northeastern United States is considered under-utilized with the exception of the portion in the Gulf of Maine (Reid et al. 1999) and is neither overfished nor is overfishing occurring (NMFS 2014a, 2014b).

Atlantic herring are planktivorous during all life stages, feeding almost entirely on zooplankton and do not rely directly on benthic food sources for their diet.

Atlantic herring spawn once a year in late August to November, in the coastal ocean waters of the Gulf of Maine and George's Bank. Atlantic herring never spawn in brackish water and rarely move into fresh water (Smith 1985). Post-spawn adults migrate to the New York Bight to overwinter from December to April. The autumn migration to overwintering areas is done in tight schools while the spring migration to spawning areas is much more diffuse. Fish that pass through the mid-Atlantic Bight are typically four years of age or older (USACE 2000).

Larval herring are planktonic and for autumn-spawned fish this stage can last 4 to 8 months. Some larvae remain at the spawning site while others drift with ocean currents and eventually reach eastern Long Island Sound. In the Gulf of Maine, larvae occur at temperatures ranging from 9 to 16°C (48 to 61°F), and a salinity of 32 ppt. During post-metamorphosis, which occurs through April and May, juveniles form large schools and move into shallow waters.

Large schools of juvenile Atlantic herring have been found in Connecticut and southern Massachusetts in May and June. In the summer and autumn, juveniles move out of the nearshore waters to overwinter in deeper waters or near the bottom in offshore areas. Within Long Island Sound, springtime abundances have been reported as being highest at temperatures ranging from 9 to 10°C (48 to 50°F), depths ranging from 10 to 30 m (33 to 98 feet), and salinity ranging from 25 to 28 ppt. Within the New York Harbor Estuary, catches of herring were highest at temperatures ranging from 3 to 6°C (37 to 43°F) and in the deeper portions of the estuary (USACE 2000). Juveniles in the NEFSC bottom trawl surveys in the Harbor Estuary, were found to prefer temperatures at 2 to 16°C (36 to 61°F) and 12 to 22°C (54 to 72°F), being most abundant at 4 to 6°C (40 to 43°F) and 15 to 18°C (59 to 64°F). Juveniles are commonly found at depths ranging from 30 to 135 m (98 to 443 feet) which varies seasonally (depths increasing with the summer months) (Reid et al. 1999).

On average, males and females mature at about 25 to 27 cm (10 to 11 inches). In the NEFSC bottom trawl surveys, adults collected were most abundant at 3 to 6°C (37 to 43°F) at depths ranging from 4.5 to 13.5 m (14 to 44 feet). Atlantic herring are most commonly found in salinities greater than or equal to 28 ppt (Reid et al. 1999). Juveniles and adults perform diel and semi-diel vertical migrations in response to daily photo periods and increased turbidity. Being sensitive to light intensity, activity is highest after sunrise and just before sunset where the herring will avoid the surface during daylight to avoid predators (Reid et al. 1999).

No spawning would occur within the Upper Bay or lower Hudson River, nor would larvae be likely to occur there. Juvenile and adult Atlantic herring would not likely occur within the Upper Bay in high numbers due to the relatively low salinity and shallow depths, particularly in the project area. Able et al. (1998) did not collect any Atlantic herring in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October in 1993 and 1994; however, Bain et al. (2006) collected Atlantic herring within the Hudson River Park during sampling conducted from June 2002 through June 2004. Atlantic herring were also collected in the lower Hudson River during Utilities fish monitoring from 2000-2009. Because this species' stock ranges coastwide, the fraction of the population that may occur within the project area would be very small.

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to Atlantic herring, which are not directly dependent on benthic habitats for food or refuge. Spawning usually occurs at the bottom in deeper waters on the continental shelf, and is not likely to occur in coastal estuaries, meaning that construction activities are not likely to disrupt spawning. Nursery habitat for this species is typically characterized as open water where juveniles form schools within the water column; young-of-the-year fish are not directly associated with benthic habitats. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Atlantic Mackerel (*Scomber scombrus*)

Atlantic mackerel is a pelagic marine fish that occurs in the western North Atlantic from Labrador to North Carolina. It sustains fisheries from the Gulf of St. Lawrence and Nova Scotia to the Cape Hatteras area. There may be two populations: one occurring in the northern Atlantic and associated with the New England and Maritime Canadian coast, and another more southerly population inhabiting the mid-Atlantic coast. Both populations overwinter in the deep waters at the edge of the continental shelf, generally moving inshore (in a northeastern direction) during the spring, and reversing this migration in autumn. Essential fish habitat for coastal migratory pelagic species such as cobia includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* The Hudson River within the vicinity of the project site is within an area designated as EFH for juvenile and adult Atlantic mackerel. The Atlantic mackerel fishery is not considered overfished and overfishing is not occurring (NMFS 2014a, 2014b).

Atlantic mackerel are opportunistic feeders as juveniles and adults, consuming a wide variety of pelagic prey organisms including crustaceans, mollusks, polychaete worms, and fishes and do not rely directly on benthic food sources for their diet.

The southern population begins its spawning migration by moving inshore between the Delaware Bay and Cape Hatteras and in a northeastern direction along the coast. The timing of the migration and spawn is a result of warming water temperatures. The peak spawn for the southern population occurs off New Jersey and Long Island Sound in April and May. Most spawning occurs in the shoreward half of the shelf and in waters from 7 to 14°C (45-57°F) (with the peak being 10 to 12°C (50-54°F) (Studholme et al. 1999).

Eggs and larval Atlantic mackerel are not likely to occur in the lower Hudson River based on the location of the spawning habitat.

By June there are schools of juveniles off Massachusetts, and they move into the Gulf of Maine by June and July where they remain for the summer. In the Hudson-Raritan Estuary, juveniles are present from April to December, but are most common from April through June and October through November. Adults are present from April through June and from September through December, most commonly from April to May and from October to November (USACE 2000). Juveniles begin exhibiting swimming and schooling behaviors starting at 30-50 mm (1.2-2.0 in) and closely resemble adults when about 1 year in age. In the Hudson-Raritan Bay estuary, juveniles are present in the spring and summer months, preferring depths from 4.9-9.8 m (16-32 ft), salinity ranges from 26-28.9 ppt, dissolved oxygen from 7.3-8.0 mg/L and temperatures from 17.6-21.7°C (64-71°F) (Studholme et al. 1999).

Adult Atlantic mackerel can range from 26 cm (10 in) in their second year to about 40 cm (15.8 in) in their sixth year. NEFSC trawl surveys show that adults are found in the spring at temperature ranges from 5-13°C (41-55°F) dispersed from 0-380 m (1,250 ft) depths (most abundant at 160-170 m [525-558 ft]), and in the summer at temperatures ranging from 4-14°C (39-57°F) at depths of 10-180 m (33-591 ft) (abundant at 50-70 m [164-230 ft]). Adults also prefer salinities of 25 ppt or greater (Studholme et al. 1999).

Due to salinity requirements, adults are likely to occur only as occasional transient individuals within the lower Hudson River Estuary. Atlantic mackerel were rarely collected during trawls in the New York Harbor by USACE from October 1998 through November 1999 (USACE 1999). EEA collected just one Atlantic mackerel in 312 interpier and underpier trawls at Pier 76 between February 1986 and March 1988 (EEA 1988). Able et al. (1998) did not collect any Atlantic mackerel in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October in 1993 and 1994. No Atlantic mackerel were collected from within the Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006) and no Atlantic mackerel were collected during Utilities fish monitoring from 2000-2009. Most individuals are found in the Lower Harbor (Raritan Bay and Sandy Hook Bay) (Woodhead and McEnroe 1991 in USACE 1999). Because the habitat found within the lower Hudson River Estuary does not represent a significant portion of the EFH for this species, and individuals would rarely occur in the vicinity of Pier 54, significant adverse impacts would not occur to the EFH for this species.

Black Sea Bass (*Centropristis striata*)

Black sea bass is a marine species that occurs from Cape Cod, Massachusetts to Cape Canaveral, Florida. The fishery is divided into two populations delineated by Cape Hatteras, North Carolina. The northern population migrates seasonally: inshore and north in the spring and offshore and south in the autumn. In the autumn, older fish move offshore sooner and overwinter in deeper waters (73 to 163 m [240 to 535 feet]) than young-of-the-year fish (56 to 110 m [184 to 361 feet]). The Hudson River within the vicinity of the project site is within an area designated as EFH for juvenile and adult black sea bass. While previously considered overfished, management efforts have been successful in rebuilding the stock and it is no longer considered overfished and overfishing is not occurring (ASMFC 2003; NMFS 2014a, 2014b, 2014c). The black sea bass stock assessment update in 2012 indicates that the stock continues to be rebuilt (ASMFC 2014a).

Black sea bass can tolerate temperatures as low as 6°C (43°F) but are most abundant in offshore waters warmer than 9°C (48°F) and between 20 to 60 m (66 to 197 feet) deep (USACE 2000). During the spring migration, adults move to spawning grounds in deep-water nearshore habitat and juveniles move into shallow estuaries.

Black sea bass are benthic feeders, consuming crabs, shrimp, mollusks, small fishes, and squid. Woodhead (1990) describes black sea bass as a common summer transient in the New York Harbor. Individuals have been collected in the New York Harbor and the Arthur Kill (Smith 1985) and in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October 1993 and 1994. Young-of-the-year have been collected in the lower Hudson River off Manhattan from mid-July to September (Able et al. 1995), although no individuals of this species were collected within Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006). Low abundances were collected during Utilities fish monitoring from 2000-2009 and the USACE collected low numbers of individuals in trawls conducted within the Port Jersey area from October 1998 through November 1999 (USACE 1999).

Spawning generally takes place in the summer for the northern population, in water 18 to 45 m deep from the Chesapeake Bay to Montauk, Long Island, NY.

Larvae develop for the most part in continental-shelf waters and are most abundant in the southern portion of the Middle Atlantic Bight. Larvae quickly move into estuaries and become associated with benthic habitats. Those young-of-year fish in estuaries occupy benthic habitats with shells, amphipod tubes, and deep-channel rubble and have been noted to appear on inshore jetties in late May to early June. In the Hudson River, young-of-the-year have been captured in open water and interpier areas. Juvenile sea bass occur in the saline portions of estuaries from Massachusetts to Florida starting with the initial spring migration until late autumn and are commonly found around jetties, piers, wrecks, and bottom areas with shells (USACE 2000). They appear to prefer hard bottom (Bigelow and Schroeder 1953).

Juveniles in estuaries and the inner continental shelf grow up to 19 cm (7.5 inches). YOY from July to September inhabit estuarine areas in the Mid-Atlantic Bight at depths from 1 to 38 m (3 to 125 feet) preferring rough bottoms, shell patch substrates and find shelter around manmade structures, including vessel moorings. Juveniles can be found in water temperatures ranging from 6 to 30°C (43 to 86°F) and salinities ranging from 8 to 38 ppt (but most preferring 18 to 20 ppt). The YOY are migratory during some portions of the first year. They migrate out of the estuary and away from inner continental shelf nursery areas during the autumn as water temperatures drop (Steimle et al. 1999b). Adult black sea bass prefer similar habitat conditions as that of the juvenile and perform similar migratory patterns. Adults also find shelter around manmade structures (Steimle et al. 1999b).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to black sea bass. The loss of benthic macroinvertebrates within the pile footprints would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. This species is structure-oriented and would likely be attracted to the structure provided by the pile field from removal of the existing Pier 54 platform and new piles under the elevated new Pier 54, where it would feed on prey organisms associated with the structures. Spawning occurs in deeper waters over the continental shelf, meaning that construction activities are not likely to disrupt spawning. Nursery habitat for this species is typically characterized as shallow, estuarine benthic areas, where structural complexity appears to be an essential feature of the nursery habitat. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species and would likely provide structurally complex EFH for juvenile black sea bass.

Bluefish (*Pomatomus saltatrix*)

Bluefish is a marine species that occurs in temperate and tropical waters on the continental shelf and in estuarine habitats around the world. In North America, bluefish live along most of the Atlantic coastal waters from Nova Scotia south, around the tip of Florida, and along the Gulf Coast to Mexico. Bluefish migrate between summering and wintering grounds, generally traveling in groups of fish of similar sizes that are loosely aggregated with other groups. They generally migrate north in the spring and summer and south in the autumn and winter. Along the North Atlantic, summering ground centers are located in the New York Bight as well as southern New England and northern sections of the North Carolina coastline. Wintering grounds are found in the southeastern parts of the Florida coast. The Hudson River within the vicinity of the project site is within an area designated as EFH for juvenile and adult bluefish. In past years, Bluefish was categorized as overfished—the stock size was below the minimum threshold set for this species—and a rebuilding program has been implemented. However, recent estimates of fishing mortality suggest that the rebuilding program, state-by-state quota system, and recreational harvest limit have been successful and that overfishing is no longer occurring (MAFMC 2002, 2014a, 2014b). As a result, the bluefish stock in the northeast is now rebuilt (NMFS 2014c).

Juvenile bluefish are carnivorous consuming fishes and shrimp in the water column and from benthic habitats. Adults are almost strictly piscivorous and feed on prey organisms in the water column.

There are two spawning stocks along the U.S. Atlantic coast—a south Atlantic spring spawn, and mid-Atlantic summer spawn. The fish active in the spring spawn migrate to the Gulf Stream/coastal shelf interface between northern Florida and Cape Hatteras, in April and May. Post-spring spawn, smaller bluefish drift west while the larger fish slowly migrate north along the shelf and west into mid-Atlantic bays and estuaries including the Harbor Estuary where they stay until autumn. Summer spawning fish migrate to the mid-Atlantic from Cape Cod to Cape Hatteras in June through August. Summer post-spawn fish head towards the mid-Atlantic shores and are particularly abundant in Long Island Sound (USACE 2000, Fahay et al. 1999). Bluefish eggs and larvae are pelagic in nearshore and offshore habitat and are not typically found in coastal estuaries.

Juveniles from the spring spawn drift north in the early summer and also enter nursery habitats in estuaries and bays along the mid-Atlantic coast in June. Summer-spawned fish enter the estuaries in middle to late summer (Buckel et al. 1999). Juveniles in the Mid-Atlantic Bight inhabit inshore estuaries from May to October, preferring temperatures between 15 and 30°C (59 to 86°F), and salinities between 23 and 33 ppt. Although, juvenile and adult bluefish are moderately euryhaline, they will occasionally ascend into estuaries where salinities may be less than 3 ppt. Juveniles use estuaries as nursery areas, and can be found in sand, mud, silt, or clay substrates as well as *Spartina* or *Fucus* beds. Bluefish juveniles are sensitive to changes in temperature where thermal edges apparently serve as important cues to juvenile migration off shore in the winter season (Fahay et al. 1999).

Adult bluefish are pelagic and highly migratory with a seasonal occurrence in Mid-Atlantic estuaries from April to October. They prefer temperatures from 14 to 16°C (57 to 61°F) but can tolerate temperatures from 11.8 to 30.4°C (35 to 87°F) and salinities greater than 25 ppt. Adult bluefish are not uncommon in bays and larger estuaries, as well as coastal waters but are generally considered to be oceanic, inhabiting nearshore and offshore habitats (Bigelow and Schroeder 1953, Olla and Studholme 1971 in Fahay et al. 1999).

Within the Harbor Estuary, juvenile and adult bluefish may occur in the late spring through autumn. Able et al. (1998) did not collect any bluefish in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October in 1993 and 1994; however, bluefish were collected within the Hudson River Park during sampling performed from June 2002 through June 2004 (Bain et al. 2006) and were collected in the lower Hudson River during Utilities fish monitoring from 2000-2009.

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to bluefish, which are not directly dependent on benthic habitats for food or refuge. Spawning occurs in deeper waters over the continental shelf, meaning that construction activities are not likely to disrupt spawning. Nursery habitat for this species is characterized as open-water habitat in offshore and nearshore areas, transitioning to shallow coastal habitats, including the surf zone and low-energy estuaries. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Cobia (*Rachycentron canadum*)

Cobia are a large, migratory, coastal pelagic fish of the monotypic family Rachycentridae. In the western Atlantic Ocean, cobia occur from Massachusetts to Argentina, but are most common along the south Atlantic coast of the United States and in the northern Gulf of Mexico. In the eastern Gulf of Mexico, cobia typically migrate from wintering grounds off south Florida into northeastern Gulf waters during early spring. They occur off northwest Florida, Alabama, Mississippi, and southeast Louisiana wintering grounds in the autumn. Some cobia overwinter in the northern Gulf at depths of 100 to 125 m (328 to 410 feet). The Hudson River within the vicinity of the project site is within an area designated as EFH for eggs, larval, juvenile and adult cobia. The resource is not overfished and overfishing is not occurring (NMFS 2014a, 2014b).

Information on the life history of cobia from the Gulf and the Atlantic Coast of the United States is limited. Essential fish habitat for coastal migratory pelagic species such as cobia includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* For cobia, essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat. The Gulf Stream is an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae. Preferred temperatures are greater than 20°C and salinities are greater than 25 ppt.

Cobia are likely to occur only as occasional transient individuals within the vicinity of the Proposed Project due to its coastal migrations, pelagic nature, and salinity requirements. No individuals of this species were collected from within Hudson River Park during sampling conducted from May through October in 1993 and 1994 (Able et al. 1998), from 2002 through 2004 (Bain et al. 2006) or during Utilities fish monitoring in the lower Hudson River from 2000-2009. Therefore, the Proposed Project would not result in adverse impacts to the EFH for this species.

King Mackerel (*Scomberomorus cavalla*)

King mackerel is a marine fish that inhabits Atlantic coastal waters from the Gulf of Maine to Rio de Janeiro, Brazil, including the Gulf of Mexico. There may be two distinct populations of king mackerel. One group migrates from waters near Cape Canaveral, Florida south to the Gulf of Mexico, making it there by spring and continuing along the western Florida continental shelf throughout the summer. A second group migrates to waters off the coast of the Carolinas in the summer, after spending the spring in the waters of southern Florida, and continues on in the autumn to the northern extent of the range. Essential fish habitat for coastal migratory pelagic species such as king mackerel includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* The Hudson River within the vicinity of the project site is within an area designated as EFH for eggs, larval, juvenile, and adult king mackerel. The resource is not overfished and overfishing is not occurring (NMFS 2014a, 2014b).

Overall, temperature appears to be the major factor governing the distribution of the species. The northern extent of its range is near Block Island, Rhode Island, near the 20°C (68°F) isotherm and the 18-meter (59 feet) contour. King mackerel spawn in the northern Gulf of Mexico and southern Atlantic coast. Larvae have been collected from May to October, with a peak in September. In the south Atlantic, larvae have been collected at the surface with salinities ranging from 30 to 37 ppt and temperatures from 22 to 28°C (70 to 81°F). Adults are normally found in water with salinity ranging from 32 to 36 ppt (USACE 2000).

King mackerel would likely occur only as occasional transient individuals within the Upper Bay and lower Hudson River, and would be most likely to occur in the Lower Harbor area where the salinities are higher. No individuals of this species were collected within the Hudson River Park during sampling conducted in shallow-water habitats near piers and in open-water areas in the lower Hudson River from May through October in 1993 and 1994 (Able et al. 1998), from 2002 through 2004 (Bain et al. 2006) or during Utilities fish monitoring in the lower Hudson River from 2000-2009. Therefore, the Proposed Project would not result in adverse impacts to the EFH for this species.

Red Hake (*Urophycis chuss*)

Red hake is a bottom-dwelling fish that lives on sand and mud bottoms along the continental shelf from southern Nova Scotia to North Carolina (concentrated from the southwestern part of the Georges Banks to New Jersey). The Hudson River within the vicinity of the project site is within an area designated as EFH for larval, juvenile, and adult red hake. The southern stock of red hake (the stock that occurs within the Upper Bay) is not currently considered overfished (defined as the stock size being below a prescribed biomass threshold) and overfishing is not occurring (NMFS 2014a. 2014b).

Spawning adults and eggs are common in marine portions of most coastal bays between Rhode Island and Massachusetts; however, the lower Hudson River has not been designated as EFH for red hake eggs. Spawning occurs from May to June in the New York Bight (Steimle et al. 1999a).

Larval red hake are free floating and occur in the middle and outer continental shelf. They are most common in water temperatures from 11 to 19°C (52 to 66°F) and depths from 10 to 200 m (33 to 660 feet). Recently metamorphosed juveniles remain pelagic (occupy open water areas) for about two months where they then begin growth up to 25 to 30 mm (1.0 to 1.2 inches) in total length. Shelter is a critical habitat requirement for red hake. In the autumn, young juveniles descend from the water column to the bottom and seek sheltering habitat in depressions in the sea floor. Settling peaks usually occur in October and November. Older juveniles use scallop shells, mussel beds, surf clam collars, etc., residing near these shelters until their second autumn when they move inshore to within 55 m (180 feet) depths. They will remain inshore until the temperature reaches 4°C (39°F), at which point they head offshore to overwinter (USACE 2000, Steimle et al. 1999a).

Woodhead (1990) describes red hake as a common resident of the New York Harbor system. In the Harbor Estuary, the distribution of red hake is influenced by salinity, water temperature, and dissolved oxygen. Juvenile red hake were collected when salinity was greater than 22 ppt and at depths from 5 to 50 m (16 to 164 feet) deep. Collections tapered off when salinity reached greater than 28 ppt. Adult red hake prefers temperatures from 2 to 22°C (36 to 72°F), salinity ranging from 20 to 33 ppt and depths greater than 25 m (82 feet) deep. In Middle Atlantic Bight, red hake occur most often in coastal waters in the spring and autumn, moving offshore to avoid the warm summer temperatures. Additionally, red hake have been reported to be sensitive to dissolved oxygen levels and within the Harbor Estuary they preferred dissolved concentrations of 6 mg/L or more (Steimle et al. 1999a).

Juvenile and adult red hake have the potential to occur in the deeper waters in the vicinity of Pier 54, but may be limited by occasional low DO concentrations and when salinity levels are low. Red hake were collected from within the Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006) and during Utilities fish monitoring from 2000-2009; however, this species was not collected in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October in 1993 and 1994 (Able et al. 1998). The area of the Proposed Project represents a small portion of the EFH for this species. Additionally, adults and juveniles appear to be more common in the Harbor Estuary south of the Verrazano Narrows south of the project area (Steimle et al. 1999a).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to red hake. Spawning occurs in deeper waters of the Mid-Atlantic Bight over the continental shelf. Nursery habitat for this species is typically characterized as pelagic and occurs in close association with floating vegetation and jellyfish tentacles. As juveniles get larger and settle into benthic habitats, nursery habitat for red hake transitions to benthic structure, including bivalve shells, live sea scallops and man-made structure. The loss of benthic macroinvertebrates within the pile footprints would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Adult red hake may be found in the deeper waters of the channel, but are less likely to occur in the shallow, off-channel habitat of the project area. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Scup (*Stenotomus chrysops*)

Scup is a marine fish that occurs primarily on the continental shelf from Cape Cod, Massachusetts to Cape Hatteras, North Carolina. It migrates extensively from inshore summer grounds to offshore winter grounds. Scup arrive in the waters off New Jersey and New York by early May. During the summer months, older fish (four years old or older) tend to stay in the inshore waters of the bays while the younger fish are found the more saline waters of estuaries such as the Harbor Estuary. EFH for this marine species is primarily in the higher salinity areas of the southern portion of the Upper Harbor (USACE 1999). The Hudson River within the vicinity of the project site is within an area designated as EFH for eggs, larval, and juvenile scup. Management measures implemented in 1996 have resulted in a dramatic increase in scup abundance (MAFMC 2002, ASMFC 2003). Currently, the scup stock is considered to be rebuilt, is not subject to overfishing, and is not overfished (NMFS 2014a, 2014b, 2014c).

Scup larvae are most likely planktivorous based on larval rearing experiments. Juvenile scup feed primarily on benthic macroinvertebrates and fish larvae. Adult scup are omnivorous, feeding on a variety of benthic macroinvertebrates, detritus and small fishes.

Spawning occurs in May through August with a peak in June and occurs principally in the estuaries of New York and New Jersey. Juveniles grow quickly and migrate with the rest of the population to offshore wintering grounds starting in late October and are absent from inshore waters by the end of November (USACE 2000).

Scup eggs are typically collected from May through August at depths less than 50 m (164 feet) and at temperatures ranging from 11 to 23°C (52 to 73°F) (Steimle et al. 1999c). Newly hatched larvae are pelagic and approximately 2 mm (0.08 inches) long. Eggs and larvae have not been reported from the lower Hudson River. In approximately three days, diagnostic characters of the species are evident and shortly afterwards the larvae abandon the pelagic phase and become bottom dwelling. They occur at water temperatures ranging from 14 to 22°C (57 to 72°F) and occupy more saline (23 to 33 ppt) portions of bays. They are often found within the water column at depths less than 50 m (164 feet) (Steimle et al. 1999c).

Juveniles from 15 to 30 mm (0.6 to 1.2 inches) and up to 10 cm (4 inches) are common during November. By the end of their first year they can reach up to 16 cm (6.3 inches). Juveniles inhabit estuarine intertidal areas at depths of 5 to 12 m (16 to 39 feet), particularly areas with sand and mud substrates or mussel and eelgrass beds. Juveniles prefer temperatures from about 9 to 27°C (48 to 81°F) and salinities greater than 15 ppt (Steimle et al. 1999c). Scup males and females reach sexual maturity at age two and reach about 15.5 cm (6 inches).

Juveniles may occur within the Harbor Estuary in the summer and autumn. Woodhead (1990) reports that scup is a common summer transient in the New York Harbor. Scup were collected from within the Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006) and were collected within the lower Hudson River in low abundance during Utilities fish monitoring from 2000-2009. Able et al. (1998) did not collect any scup in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October in 1993 and 1994. Eggs and larvae were not collected during Utilities ichthyoplankton sampling conducted in the lower Hudson River from 2000-2009.

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to scup. Spawning occurs primarily in the Lower New York Bay and the Eastern Long Island Bay (USACE 2000) and would not occur within the vicinity of the project area in the lower Hudson River. Therefore, spawning habitat would not be affected by project activities. Nursery habitat for this species is typically characterized as estuarine and nearshore coastal waters to a depth of approximately 38 m (125 feet). Juvenile scup would occur in the project area from summer until fall, at which time they would migrate to offshore habitats. Given the short duration and small spatial extent of construction within the project site, use of nursery habitat by juvenile scup would not be affected. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Spanish Mackerel (*Scomberomorus maculatus*)

Spanish mackerel is a marine species that can occur in the Atlantic Ocean from the Gulf of Maine to the Yucatan Peninsula. This species occurs most commonly between the Chesapeake Bay and the northern Gulf of Mexico from spring through autumn, and then heads south to overwinter in the waters of south Florida. Essential fish habitat for coastal migratory pelagic species such as Spanish mackerel includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* The Hudson River within the vicinity of the project site is within an area designated as EFH for eggs, larval, juvenile, and adult Spanish mackerel. The resource is not overfished and overfishing is not occurring (NMFS 2014a, 2014b).

Spanish mackerel are primarily piscivorous, feeding on pelagic fishes (Godcharles and Murphy 1986).

Spanish mackerel spawn in the northern extent of its range (along the northern Gulf Coast and along the Atlantic Coast). Spawning begins in mid-June in the Chesapeake Bay and in late September off Long Island, New York. Temperature is an important factor in the timing of spawning and few spawn in temperatures below 26°C (79°F). Spanish mackerel apparently spawn at night. Studies indicate that Spanish mackerel spawn over the Inner Continental Shelf in water 12 to 34 m (39 to 112 feet) deep.

Spanish mackerel eggs are pelagic and about 1 mm in diameter. Hatching takes place after about 25 hours at a temperature of 26°C. Most larvae have been collected in coastal waters of the Gulf of Mexico and the east coast of the United States. Juvenile Spanish mackerel can use low salinity estuaries (~12.8 to 19.7 ppt) as nurseries and also stay close inshore in open beach waters (USACE 2000).

Overall, temperature and salinity are indicated as the major factors governing the distribution of this species. The northern extent of their range is near Block Island, Rhode Island, near the 20°C (68°F) isotherm and the 18 meter contour. During warm years, they can be found as far north as Massachusetts. They prefer water from 21 to 27°C (70 to 81°F) and are rarely found in waters cooler than 18°C (64°F). Adult Spanish mackerel generally avoid freshwater or low salinity (less than 32 ppt) areas such as the mouths of rivers (USACE 2000).

No Spanish mackerel were collected within the Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006) or during Utilities fish monitoring in the lower Hudson River from 2000-2009.

Due to salinity requirements, Spanish mackerel are likely to occur only as occasional transient individuals within the lower Hudson River Estuary. Able et al. (1998) did not collect any Spanish mackerel in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October in 1993 and 1994. No Atlantic mackerel were collected from within the Hudson River Park during sampling conducted from shallow-water habitats near piers and in open-water areas in the lower Hudson River from May through October in 1993 and 1994 (Able et al. 1998), from 2002 through 2004 (Bain et al. 2006) and no Spanish mackerel were collected during Utilities fish monitoring from 2000-2009. Most individuals are found in the Lower Harbor (Raritan Bay and Sandy Hook Bay) (Woodhead and McEnroe 1991 in USACE 1999). Because the habitat found within the lower Hudson River Estuary does not represent a significant portion of the EFH for this species, and individuals would rarely occur in the vicinity of Pier 54, significant adverse impacts would not occur to the EFH for this species.

Because this is a marine species that prefers higher salinity waters, only occasional individuals are likely to occur within the Upper Bay and lower Hudson River. Therefore, the Proposed Project would not result in adverse impacts to the EFH for this species.

Summer Flounder (*Paralichthys dentatus*)

Summer flounder prefer the estuarine and shelf waters of the Atlantic Ocean and are found between Nova Scotia and southeastern Florida. They are most abundant from Cape Cod, Massachusetts, to Cape Hatteras, North Carolina. Summer flounder usually appear in the inshore waters of the New York Bight in April, continuing inshore in May and June, and reach their peak abundance in July and August. The Hudson River within the vicinity of the project site is within an area designated as EFH for larval, juvenile, and adult summer flounder. In 2002, the stock was considered overfished and was in the 8th year of a 10-year rebuilding program (NMFS 2003, MAFMC 2002). The latest stock assessment for summer flounder indicates that management measures have been successful and the mid-Atlantic stock has been rebuilt; the resource is no longer overfished and overfishing is no longer occurring (NMFS 2014a, 2014b, 2014c).

Spawning takes place in the New York Bight in nearshore waters outside estuarine systems in September to October, at surface water temperatures of 7 to 14°C (45 to 57°F), with a peak around 10 to 12°C (50 to 54°F) (Packer et al. 1999).

Larvae occur in water from 0 to 22°C (32 to 72°F) and are transported to estuarine nurseries by currents. Juvenile summer flounder are well adapted to the temperature and salinity ranges present in estuarine habitats. They are distributed throughout the estuary prior to late summer and are more concentrated in sea grass beds as opposed to tidal marshes in the late summer and early autumn (USACE 2000). Planktonic larvae (2 to 13 mm [0.08 to 0.5 in]) have been found in temperatures ranging from 0 to 23°C (32 to 73°F), but are most abundant between 9 to 17°C (48 to 63°F). Salinity preference within the New Jersey area for this species was found between 20 to 30 ppt. In the Mid -Atlantic Bight, larvae were found at depths from 10 to 70 m (33 to 230 feet). Greater densities of young fish were found in or near inlets (Packer et al. 1999).

Juvenile summer flounder move into shallow (found usually at 0.5 to 5.0 m [1.6 to 16 feet] in depth) estuaries using them as nursery habitat in the autumn, summer, and spring months. Juvenile summer flounder are able to withstand a wider range of temperatures (greater than 11°C [52°F]) and salinities from 10 to 30 ppt. Juveniles can be found on mud and sand substrates in flats, channels, salt marsh creeks, and eelgrass beds (Packer et al. 1999).

Adult summer flounder feed both in the shelf waters and estuaries and are more active in the daylight hours when they feed by sight (USACE 2000). Adults are found to grow to lengths ranging from 25 to 71 cm (10 to 28 feet). Adults inhabit sand substrates usually at depths up to 25 m (82 feet), at temperatures ranging from 9 to 26°C (48 to 79°F) in the autumn, 4 to 13°C (39 to 55°F) in the winter, 2 to 20°C (36 to 72°F) in the spring, and 9 to 27°C (48 to 81°F) in the summer. Salinity is known to have minimal effect on distribution in comparison to substrate preference (Packer et al. 1999).

Spawning of summer flounder would not occur in the vicinity of Pier 54. Summer flounder have been collected in areas of the Upper Bay, primarily in the summer (USACE 1999). Summer flounder were collected from within the Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006) and were collected in Utilities fish-monitoring samples from 2000-2009, although they were less abundant than most of the other flatfishes. This species was also collected in shallow-water habitats near piers and in open-water areas in the lower Hudson River during sampling conducted from May through October 1993 and 1994 (Able et al. 1998).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to summer flounder. Spawning occurs in deeper waters on the continental shelf and would not be affected by the project. Nursery habitat for this species is typically characterized as benthic habitats in shallow, coastal estuaries and specifically tidal creeks. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the removal of existing Pier 54 platform would restore natural light conditions to aquatic habitat within this portion of Hudson River Park. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Windowpane (*Scophthalmus aquosus*)

Windowpane, also called sand flounder, is found from the Gulf of St. Lawrence to South Carolina and has its maximum abundance in the New York Bight. Windowpane are generally found offshore on sandy bottoms in water between 50 and 80 m deep (164 to 262 feet), and close inshore in estuaries just below the mean low water mark. They migrate onshore in the shallow shoal water in the summer and early autumn as water temperatures increase, and migrate offshore during the winter and early spring months when temperatures decrease. The Hudson River within the vicinity of the project site is within an area designated as EFH for eggs, larval, juvenile, and adult windowpane. The southern New England/Middle Atlantic windowpane stock is not currently considered to be overfished and overfishing is not currently occurring (NMFS 2014a, 2014b). The southern New England/Middle Atlantic Windowpane stock was considered to be rebuilt in 2012 (NMFS 2014c).

Juvenile and adult windowpane feed primarily on mysid and decapod shrimp and fish larvae.

Windowpane spawn within the mid-Atlantic Bight from April to December in the bottom waters with temperatures ranging from 8.5 to 13.5°C (47 to 56°F). Spawning peaks occur in May and then again in the autumn in the southern portion of the Bight (USACE 2000). Buoyant eggs and larvae that settle to the bottom are found predominately in the estuaries and coastal shelf water for the spring spawned eggs, and in the coastal shelf waters alone for those eggs spawned in the autumn. Windowpane eggs are found floating in the water column at temperatures of 5 to 20°C (41 to 68°F), specifically at 4 to 16°C (39 to 61°F) in spring (March through May), 10 to 16°C (50 to 61°F) in summer (June through August), and 14 to 20°C (57 to 68ºF) in autumn (September through November), and within depths less than 70 m (230 feet) (Chang et al. 1999). Larvae are typically found in the area of the estuary where salinity ranges from 18 to 30 ppt in the spring and on the shelf in the autumn.

Juvenile windowpane were found year-round in both the shelf waters and in the Harbor Estuary. Larvae are found at similar temperature and depth as the egg stage of this species, particularly at 3 to 14°C (37 to 57°F) in the spring, 10 to 17°C (50 to 63°F) in the summer, and 13 to 19°C (55 to 66°F) in the autumn (Chang et al. 1999). Within the Harbor Estuary, juvenile fish were fairly evenly distributed but seemed to prefer the deeper channels in the winter and summer. They were most abundant where bottom water temperatures ranged from 5 to 23°C (41 to 73°F), depths ranged from 7 to 17 m (23 to 56 feet), salinities ranged from 22 to 30 ppt, and dissolved oxygen concentrations ranged from 7 to 11 mg/L.

Similarly, adults were fairly evenly distributed year-round, preferring deeper channels in the summer months. Adults were collected in bottom waters where temperatures ranged from 0 to 23°C (32 to 73°F), depths were less then 25 m (82 feet), salinity ranged from 15 to 33 ppt, and dissolved oxygen ranged from 2 to 13 mg/L (USACE 2000).

All stages of windowpane have the potential to occur within the vicinity of Pier 54, and individuals were collected within the Hudson River Park during sampling conducted from 2002 through 2004 and during Utilities fish monitoring from 2000-2009. This species was not collected in shallow-water habitats near piers and in open-water areas in the lower Hudson River from May through October in 1993 and 1994 (Able et al. 1998). As with winter flounder, this species is widely distributed throughout the Harbor Estuary.

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to windowpane. Spawning occurs from deeper waters on the continental shelf to the shallow waters of coastal estuaries. Given the short duration and small spatial extent of construction within the project site, spawning would not be disrupted. Nursery habitat for this species is typically characterized as benthic habitat but is not limited to shallow water; deeper waters of the continental shelf also serve as nursery habitat for juvenile windowpane. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Winter Flounder (*Pseudopleuronectes americanus*)

Winter flounder can be found from Labrador to North Carolina but most commonly in estuaries from the Gulf of St. Lawrence to the Chesapeake Bay including the Harbor Estuary (Heimbuch et al. 1994, USACE 2000). This fairly small, thick flatfish is abundant in the Harbor Estuary, where it is a resident, but may also migrate upriver into fresh water (Heimbuch et al. 1994). The Hudson River within the vicinity of the project site is within an area designated as EFH for eggs, larval, juvenile, and adult winter flounder. While winter flounder are found throughout the Harbor Estuary, this species is currently experiencing high fishing rates that are in excess of natural production (annual exploitation rates from 55 to 70 percent). The Southern New England/Mid-Atlantic stock unit (which includes the New York population), is considered to be overfished although overfishing is no longer occurring (NMFS 2014a, 2014b). This species has been in a stock rebuilding program since 1988 (ASMFC 2014b). Based on the 2010 spawning stock biomass, it was estimated that the SNE/MA stock was at 16% of its target biomass (ASMFC 2014b).

Larval winter flounder are planktivorous. Juveniles feed on a variety of worms and small crustaceans. Adults eat small invertebrates and fish fry. Because they are sight feeders increased turbidity can interfere with feeding success (USACE 2000).

Winter flounder spawn during the winter and early spring, typically at night in shallow, inshore estuarine waters with sandy bottoms. Woodhead (1990) reports spawning to occur mostly in the Lower New York Bay and the New York Bight. Eggs float in the top 25 cm (10 inches) of the intertidal zone and clump together post-fertilization at which point they sink (Heimbuch et al. 1994, USACE 2000). Optimal egg hatching occurs at 3°C (37°F) and in salinity ranging from 15 to 25 ppt. Winter flounder larvae develop to juveniles within the estuarine system. In March, April and May, winter flounder larvae can be found in the Upper New York Bay near the bottom (Heimbuch et al. 1994).

For the first summer, young-of-year winter flounder remain in the shallow waters (0.1 to 10 m [0.2 to 33 feet] in depth) of bays and estuaries where they were spawned, where temperatures are less than 28°C (82°F) and salinities range from 5 to 33 ppt. Juveniles often occupy areas with sand and/or mud substrates. Juveniles beyond their first year have also been found to overwinter in estuaries at temperatures less than 25°C (77°F), salinities from 10 to 30 ppt, and depths from 1 to 5 m (3 to 16 feet) (Pereira et al. 1999). However, in winter, juvenile catches generally increased outside of the estuary while at the same time decreasing within the estuary, suggesting that juveniles migrate out of the estuary in the winter (Pearcy 1962, Warfel and Merriman 1944, and Richards 1963 in Pereira et al. 1999).

Adult winter flounder prefer depths of 20 to 48 m (66 to 158 feet) and are commonly associated with mud, sand, pebble, or gravel bottoms (USACE 2000). Adults generally leave the Harbor Estuary in the summer as water temperatures increase, returning in the autumn (Woodhead 1990). Winter flounder will live close to shore, swimming into shallow water to feed. Adults tend to move to deeper water when water temperatures increase in the summer or decrease in the autumn and winter (Heimbuch et al. 1994). NMFS Northeast Fisheries Science Center (NEFSC) trawls within the Harbor Estuary found adult winter flounder at temperatures between 4 to 12°C (39 to 54°F) and salinities as low as 15 ppt, although most were found at salinities greater than 22 ppt. The bulk of the adult catch occurred in water depths of 25 m (82 feet) or less in the spring (during and just after spawning) and 25 m or deeper in the autumn (prior to spawning) (Pereira et al. 1999).

All life stages of this benthic species have the potential to occur within the vicinity of Pier 54. Winter flounder were collected from within the Hudson River Park during sampling conducted from 2002 through 2004 (Bain et al. 2006), during sampling of shallow-water habitats near piers and in open-water areas from May through October 1993 and 1994 (Able et al. 1998), and during Utilities fish monitoring from 2000-2009. Within the Harbor Estuary, young-of-the-year may occur from early April through December. Yearling winter flounder may occur from late May to December. Catches of winter flounder in the Harbor Estuary off Manhattan have been reported to be highest from May through June (Woodhead 1990). Older winter flounder have been found in the Harbor Estuary from late May to September (Heimbuch et al. 1994).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to winter flounder. Spawning occurs at a wide range of depths and is not limited to relatively shallow waters like those in the project area. Given the short duration and small spatial extent of construction within the project site, spawning would not be disrupted. In addition, consistent with USACE Special Condition G[1], no piles will be installed or removed between

[1] Hudson River Park – Segment 5 Permits: USACE Permit 1998-00290; and NYSDEC Permit 2-6299-00004/00001.

November 1 and April 30 to protect overwintering fishery resources, including spawning winter flounder. Nursery habitat for this species is typically characterized as shallow, benthic areas within coastal estuaries. Habitat use by juvenile winter flounder is highly variable among estuaries and varies from year to year, as well (Pereira et al. 1999), suggesting that habitat disturbance is less likely to have the same impact on juvenile winter flounder as it might on species with more specific habitat requirements. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Dusky Shark (*Carcharhinus obscurus*)

The dusky shark is a relatively common species that occurs in warm and temperate continental waters throughout the world. Dusky sharks in the western Atlantic Ocean from Cape Cod south to Brazil, and on George’s Bank (Bigelow and Schroeder 1953). It is generally found in both nearshore and offshore waters, where it occupies habitats from the surf zone to well offshore, and from the surface to depths of 400 m (1,312 ft) (Compagno 1984), but it is not considered to be oceanic (Compagno 1984). The lower Hudson River is within an area designated as EFH for neonate dusky sharks. This species is vulnerable to overfishing due to its frequent harvest on coastal and pelagic long lines. Possession of this species is prohibited by Fishery Management Plan due to significant declines in catch rates over the past 20 years. Listed by NMFS as a “special concern species,” dusky shark stock is considered to be overfished and overfishing is currently occurring (NMFS 2011, 2014a, 2014b). NMFS is currently developing a rebuilding plan for dusky shark under Amendment 5b to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan (NMFS 2014d).

The dusky shark feeds on a variety of fishes include herring, eels, croakers, bluefish, mackerel, flatfish, skates and rays, and other sharks, as well as decapod crabs and mollusks.

Spawning occurs in nearshore and offshore water over the continental shelf during the spring. Although adults rarely enter estuarine waters, females do so in order to pup. Neonate dusky sharks remain in the shallow estuarine habitats following birth, but are typically found at depths greater than 14 feet.

Dusky sharks are likely to occur only as occasional transients within the Upper Bay and lower Hudson River, and would be most likely to occur in the Lower Harbor area where the salinities are higher and the waters are deeper than further upstream. This species has not been collected during the various fish sampling efforts conducted in the vicinity of the Hudson River Park (Able et al. 1995, Able et al. 1998, Bain et al. 2006, Utilities fish monitoring data). Impacts to benthic habitat associated with the installation of piles would be short in duration and highly localized. Therefore, the Proposed Project would not result in adverse impacts to the EFH for this species.

Sandbar Shark (*Carcharhinus plumbeus*)

The sandbar shark is found throughout the world in subtropical and warm temperate waters, and is common to many coastal habitats. It is bottom-dwelling and most commonly found in 20 to 55 m (66 to 180 feet) waters. The Hudson River within the vicinity of the project site is within an area designated as EFH for neonate and adult sandbar sharks. The sandbar shark is overfished although overfishing is not currently occurring (NMFS 2014a, 2014b). This species is currently in a rebuilding plan under Amendment 5a to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan (NMFS 2013a).

The diet of the sandbar shark consists primarily of crustaceans, including blue crabs and mantis shrimp, as well as fishes such as menhaden, Atlantic croaker, anchovy, sea robins, windowpane flounder, hogchoker and skates (Ellis 2003).

The sandbar shark is a slow-growing species. Both sexes reach maturity at about 180 cm (71 inches) total length. Estimates of age-at-maturity range from 15 to 16 years to 29 to 30 years, although 15 to 16 years is the commonly accepted age-at-maturity. Sandbar sharks produce two litters per year, with each litter consisting of 1 to 14 pups. The gestation period lasts approximately one year and reproduction is biennial. Young are born at about 60 cm (24 inches) (smaller in the northern parts of the North American range) from March to July. In the United States, the sandbar shark uses estuarine nurseries in shallow coastal waters from Cape Canaveral, Florida, to the northern extent of the range at Great Bay, New Jersey (Merson and Pratt 1997). Bays from Delaware to North Carolina are also important nursery areas (Knickle 2001).

Juveniles return to Delaware Bay after the winter. Neonates have been captured in Delaware Bay in late June. Young-of-the-year are present in Delaware Bay until early October when the temperature falls below 21°C (70°F). Juveniles have been found as far north as Martha's Vineyard, Massachusetts in the summer. Neonate and juvenile sandbar sharks are most commonly found in salinities greater than 22 ppt and temperatures greater than 21°C (70°F). Essential fish habitat, including nursery habitat, for these life stages include shallow coastal areas to the 25 m (82 feet) isobath from Montauk, Long Island, New York, south to Cape Canaveral, Florida.

This species would not occur within the lower Hudson River except as occasional transient individuals. None have been collected during the various fish sampling efforts conducted in the vicinity of the Hudson River Park (Able et al. 1995, Able et al. 1998, Bain et al. 2006, Utilities fish monitoring data). Impacts to benthic habitat associated with the installation of piles would be short in duration and highly localized. Therefore, the Proposed Project would not result in adverse impacts to the EFH for this species.

Sand Tiger Shark (*Carcharias taurus*)

The sand tiger shark is a large, coastal marine species found in tropical and warm temperate waters throughout the world and is often found in shallow water (less than 4 m [13 ft]). Essential fish habitat for neonates includes the shallow coastal waters from Barnegat Inlet, New Jersey to Cape Canaveral, Florida to the 25 m (82 ft) isobath (USACE 2000). The project area is not within the geographic range designated as EFH for this species in NMFS Guide to Essential Fish Habitat Descriptions; however, conflicting information provided in the Summary of Essential Fish Habitat (EFH) Designation, also provided by NMFS, states that neonates are considered to have EFH in the lower Hudson River. The Hudson River within the vicinity of the project site in the latter case, would be within an area designated as EFH for neonate sand tiger sharks.

Overfishing of the large aggregations associated with mating has led to a declining population. For this reason, the sand tiger shark is listed by NMFS as a "species of concern" (NMFS 2010).

Common prey of the sand tiger shark include herring, bluefish, flatfishes, rays, squid, crabs, and other sharks (Knickle 2012). Males mature between 190-195 cm (75-77 in) TL or four to five years, and females at more than 220 cm (87 in) or six years. The sand tiger shark has limited reproductive potential, typically producing only two live young per litter measuring approximately 100 cm (39 in) each. Embryos, being cannibalistic, usually consume sibling embryos *in utero* until only one from each oviduct survives. After birth, neonates migrate northward in the summer to estuarine nursery areas. In North America, the species gives birth in March and April and during the winter in the southern portion of its range.

Young sand tiger sharks migrate northward to nursery areas in the coastal sounds and estuaries of the Mid-Atlantic Bight, including: Chesapeake Bay, Delaware Bay, Sandy Hook, and Narragansett Bay. Habitat for this species ranges from shallow coastal waters, including those in the lower Hudson River, to deeper coastal waters. Neonate sand tiger sharks would not occur within the Upper Bay or lower Hudson River except as occasional transient individuals. This species has not been collected during the various fish sampling efforts conducted in the vicinity of the Hudson River Park (Able et al. 1995, Able et al. 1998, Bain et al. 2006, Utilities fish monitoring data). Furthermore, impacts to benthic habitat associated with the installation of piles would be short in duration and highly localized. Therefore, the Proposed Project would not result in adverse impacts to the EFH for this species.

Clearnose Skate *(Raja eglanteria)*

The clearnose skate occurs along the Atlantic coast from the Nova Scotian Shelf to northeastern Florida and in the northern Gulf of Mexico from Texas to Florida. It is considered a southern species that is rare in the northern part of its range (Packer et al. 2003a). North of Cape Hatteras, clearnose skates move inshore and northward along the continental shelf during the spring and early summer and offshore and southward during autumn and early winter. This species occurs off the coast of New Jersey and New York from late April through May and October through November (Packer et al. 2003a). The Hudson River within the vicinity of the project site is within an area designated as EFH for juvenile and adult clearnose skates. The northeastern clearnose skate stock is not overfished and nor is overfishing occurring (NMFS 2014a, 2014b).

Clearnose skates consume a variety of benthic macroinvertebrates but feed primarily on decapods crustaceans and fishes.

In the Hudson-Raritan Estuary, the largest numbers were collected during the summer in bottom trawls, particularly in and near channels and south of Coney Island. Small numbers were collected in the spring and autumn, with very few collected in the winter. The distribution of adults in Hudson-Raritan Estuary trawls was similar to that of the juveniles (Packer et al. 2003a).

Spawning takes place in spring and summer north of Cape Hatteras. Clearnose skates produce a pair of eggs during each of the multiple reproductive events each season and may produce up to 35 pairs of eggs in a year. Eggs are deposited and attached to submerged vegetation or structure and incubate for approximately 90 days, at which time a fully formed juvenile clearnose skate hatches from the egg case.

Clearnose skates may occur in the Upper Bay and lower Hudson River in spring and autumn although the larger population of this southern species is concentrated around the Delmarva Peninsula and further south. The center of distribution for juvenile and adult clearnose skates is in coastal waters from Delaware Bay south to Cape Hatteras, with fewer individuals collected in the Hudson/Raritan estuary and Long Island Sound. Those individuals that have been collected near the Hudson River were found near deeper channel habitats. Juveniles and adults are most common at depths ranging from 16 – 26 ft and over soft sediments at salinities > 20 ppt.

This skate is found on soft bottoms along the continental shelf but will also occur on rocky or gravelly bottoms. It is most abundant at depths less than 111 m (364 feet). The Hudson-Raritan trawls found juveniles most abundant at depths of 5 to 7 m (16 to 23 feet) and temperatures 13 to 24°C (55 to 75°F). Adults were most abundant at depths of 5 to 8 m (16 to 26 feet) and temperatures 9 to 24°C (48 to 75°F). In this survey, clearnose skates were found at salinities ranging from 22 to 32 ppt (Packer et al. 2003a). This species has not been collected during the various fish sampling efforts conducted in the vicinity of the Hudson River Park (Able et al. 1995, Able et al. 1998, Bain et al. 2006, Utilities fish monitoring data).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to clearnose skate. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Spawning usually occurs in deeper waters on the continental shelf and would not occur in the project area. Nursery habitat for this species is similar to that used by adult clearnose skates and varies seasonally. Juvenile and adult clearnose skates would occur in the vicinity of the project area during spring, summer, and autumn, but would occur in deeper water (>6-8 m) in the adjacent channel. The majority of clearnose skates have been collected at salinities that exceed or nearly exceed the average salinities near the project area (i.e., 25-33 ppt). Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Little Skate *(Leucoraja erinacea)*

Little skates occur from Nova Scotia to Cape Hatteras and are one of the most dominant demersal (bottom-dwelling) species in the northwest Atlantic. The center of abundance is in the northern portion of the Mid-Atlantic Bight and on George’s Bank, where it is found year-round. Little skates do not make extensive migrations but do move onshore and offshore with the seasons, generally to shallow waters in the spring and deeper waters in winter (Packer et al. 2003b). The Hudson River within the vicinity of the project site is within an area designated as EFH for juvenile and adult little skates. The northeastern little skate stock is not currently overfished nor is overfishing occurring (NMFS 2014a, 2014b).

Little skates consume a diversity of benthic macroinvertebrates but most commonly prey upon decapod crustaceans and amphipods, as well as other benthic crustaceans, polychaetes, bivalves and fishes.

In the Hudson/Raritan estuary, juveniles of this species occur most commonly during winter and spring, but makes short migrations to deeper waters during the summer months. Adults were uncommon in the estuary.

Spawning takes place year-round but is most frequent during winter and summer. Little skates produce a pair of eggs during each of the multiple reproductive events each season and may produce up to 30 pairs of eggs in a year. Eggs are deposited and attached to submerged vegetation or structure and incubate for approximately 180 days, at which time a fully formed juvenile little skate hatches from the egg case.

Juveniles in the Hudson/Raritan estuary are most common at depths ranging from 20 – 26 ft and over coarse, sandy and gravel sediments at salinities between 15 and 33 ppt, with the majority found at salinities > 25 ppt. Fewer adults are found in the estuary, but those that do occur are most common at depths > 23 ft and salinities > 20 ppt.

Little skates are generally found on sandy or gravelly bottoms but can also be found on muddy bottoms. This species are generally found in the Hudson-Raritan Estuary when temperatures are less than about 16 to 18°C (61 to 64°F). Juvenile little skates are generally absent from the Hudson-Raritan Estuary during summer months and well distributed throughout in the spring, autumn, and winter. Those that were collected in the estuary in the summer during trawl surveys were generally found in the deeper, warmer waters of channels. Juveniles were generally found at depths between 4 and 24 m (13 to 79 feet) and salinities between 17 and 35 ppt (but most at ≥ 25 ppt).

Few adult little skates were collected during the Hudson-Raritan Estuary surveys (conducted 1992-1997). Temperatures where this species was collected ranged from 1 to 17°C (34 to 63°F), depths from 5 to 16 m (16 to 52 feet), and salinities from 18 to 32 ppt (but most at ≥ 25 ppt). Only two adults were collected during the summer. Based on NEFSC trawls, juvenile little skates have the potential to occur in the Upper Bay and lower Hudson River in the autumn through the spring while adults occur less commonly. No little skates were collected during the various fish sampling efforts conducted in the vicinity of the Hudson River Park (Able et al. 1995, Able et al. 1998, Bain et al. 2006, Utilities fish monitoring data).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to little skate. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Spawning usually occurs in deeper waters on the continental shelf and would not occur in the project area. Given the short duration and small spatial extent of construction within the project site, spawning would not be disrupted. Nursery habitat for this species is similar to that used by adult little skates and varies seasonally. Juvenile and adult little skates would occur in the vicinity of the project area during spring and possibly autumn, but would occur in deeper water (>27 m) during the rest of the year. The majority of little skates have been collected at salinities that exceed or nearly exceed the average salinities near the project area (i.e., 25-33 ppt). Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

Winter Skate *(Leucoraja ocellata)*

The winter skate occurs from the south coast of Newfoundland and the southern Gulf of St. Lawrence to Cape Hatteras. Its center of abundance is on Georges Bank and in the northern portion of the Mid-Atlantic Bight. It is often second in abundance to the little skate (*Leucoraja erinacea*) and immature winter skates are often confused with immature little skates (Packer et al. 2003c). In the Hudson/Raritan estuary, this species occurs most commonly from fall through spring, but moves offshore or into deep channel habitats during the summer months. The Hudson River within the vicinity of the project site is within an area designated as EFH for juvenile and adult winter skates. The northeastern winter skate stock in the SNE and Georges Bank is not currently overfished, but overfishing is occurring (NMFS 2014a, 2014b).

Winter skates consume a diversity of benthic macroinvertebrates but most commonly prey upon polychaetes and amphipods, as well as other benthic crustaceans, bivalves and fishes.

Spawning takes place from summer to early winter. Like other skates, winter skates produce pairs of egg cases which are deposited and attached to submerged vegetation or structure and incubate until hatching, at which time a fully formed juvenile winter skate emerges from the egg case.

In the Hudson/Raritan estuary, juvenile winter skates are most common at depths ranging from 16 – 26 ft and over sandy and gravel sediments at salinities > 20 ppt. Very few adults are found in this estuary.

This skate is found most often on sandy or gravelly bottoms but can also be found on muddy bottoms. It is most abundant at depths less than 111 m (364 feet). During surveys of the Hudson-Raritan Estuary, juvenile winter skates were generally absent during the summer and well distributed in winter, spring, and autumn. This species was most abundant in winter. Those individuals present in the summer were generally found in deeper channel waters. Juveniles are found in warmer waters during the spring and autumn (most at 6 to 9°C and 5 to 17°C, respectively) than winter (mostly in 0 to 7°C), and remain mostly around depths of 5 to 8 m (16 to 26 feet) during those seasons. Salinities ranged from 15 to 34 ppt, but most were found between 23 and 32 ppt. Very few adults were collected in these surveys (conducted 1992-1997). Too few were found to determine their habitat preferences.

Juvenile and adult winter skates have the potential to occur within the vicinity of Pier 54; however this species has not been collected during the various fish sampling efforts conducted in the vicinity of the Hudson River Park (Able et al. 1995, Able et al. 1998, Bain et al. 2006, Utilities fish monitoring data).

During in-water construction activities, temporary and localized increases in suspended sediment and loss of bottom habitat and benthic macroinvertebrates would not result in significant adverse impacts to winter skate. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Spawning usually occurs in deeper waters on the continental shelf and would not occur near the project area. Given the short duration and small spatial extent of construction within the project site, spawning would not be disrupted. Nursery habitat for this species is similar to that used by adult winter skates and varies seasonally. Juvenile and adult winter skates would occur in the vicinity of the project area during winter and spring, and autumn, but would occur in deeper water (>5-8 m) in the adjacent channel. This species would not occur in the vicinity of the project area during summer. The majority of winter skates have been collected at salinities that exceed or nearly exceed the average salinities near the project area (i.e., 25-33 ppt). Underwater noise generated during impact pile driving for Pier 54 is not likely to adversely affect this species due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects. Adverse impacts to aquatic habitat due to shading by the new pier would be minimal because of the higher elevation of the new pier. Additionally, the establishment of pile field habitat within the footprint of the existing Pier 54 would provide additional, structured habitat for fish species. Operation of the reconstructed pier would not result in significant adverse impacts to water quality or to aquatic biota. Therefore, the Proposed Project would not result in significant adverse impacts to EFH for this species.

E. POTENTIAL IMPACTS TO SHORTNOSE STURGEON AND ATLANTIC STURGEON

The federally-listed and state-listed endangered shortnose sturgeon is an anadromous benthic-feeding fish that can be found throughout the Hudson River system. Shortnose sturgeon spawn, develop, and overwinter well upriver of Pier 54, and prefer colder, deeper waters for all life stages. According to Bain (et al. 2007), shortnose sturgeon may occasionally use areas of the lower Hudson River downstream of the George Washington Bridge; however, spawning, nursery and overwintering habitats are located well upstream of the project area. The Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 1997).

The Hudson River population of shortnose sturgeon is estimated to contain approximately 61,057 fish (Bain et al. 2007). The population has increased approximately 450 percent since the 1970s. According to Secor and Woodland (2005), the shortnose sturgeon is showing signs of recovery in the Hudson River although some population segments, especially in the south of their geographic range, still display low abundance. Size and body condition of the fish caught in these studies indicate that the Hudson River population consists of relatively healthy, long-lived adults. Although larvae can be found in brackish areas of the river, the juveniles (fish ranging from 2 to 8 years old) are predominately confined to freshwater reaches above the downstream saline area of the lower Hudson River and Harbor Estuary. The primary summer habitat for shortnose sturgeon in the middle section of the Hudson River Estuary (well upriver of Pier 54) is the deep river channel (13 to 42 meters deep, 43 to 138 feet) (Bain 1997). The river channel downstream of this middle estuary area is 18 to 48 meters deep (59 to 157 feet) (Bain et al. 2007).

Long-term Hudson River fish-monitoring data, collected by the New York Utilities and others since the 1970s, also indicate that shortnose sturgeon inhabit deep-water habitats, and occur in greatest abundance north of Indian Point at river mile (RM) 46. Most shortnose sturgeon (82%) collected from 2000 through 2009 during Fall Shoals and Longitudinal River fish surveys were collected upstream of RM 46. Only three shortnose sturgeon were collected in the Battery region (RM 0-11); of those, none were collected as far downstream as Pier 54. Distribution of eggs and larvae of shortnose sturgeon is also well upriver of Pier 54. EEA (1988) and EA (1990) did not collect any shortnose sturgeon during multi-year sampling of interpier and underpier habitats in the lower Hudson River. Similarly, no sturgeon were found in interpier areas of the Hudson River Park during sampling conducted by Able et al. (1998) or Bain et al. (2006).

During winter sampling between 2003 and 2005, bottom trawls conducted in the Hudson River channel as part of the New York Utilities long-term monitoring program collected shortnose sturgeon south of the George Washington Bridge (RM 12). These are the first two years that shortnose sturgeon have occurred in this portion of the lower Hudson River during the winter period since the start of this monitoring program in 1985-1986. Of the 700 to 1,000 tows collected annually during this winter period, a total of 33 shortnose sturgeon were collected during 2003-2005 between the Statue of Liberty and the George Washington Bridge.

Atlantic sturgeon within the New York Bight Distinct Population Segment were federally listed as endangered under the Endangered Species Act effective on April 6, 2012 (77 FR 5880). Population estimates place the Hudson River spawning stock at approximately 863 individuals (Kahnle et al. 2007). The Atlantic sturgeon is the largest sturgeon found in New York, measuring up to 14 feet long and weighing up to 800 pounds (Stegemann 2012). This anadromous species occurs within the New York Harbor Estuary (Woodhead 1990) and the Hudson River Estuary. In the Hudson River, Atlantic sturgeon are found in the deeper portions and do not typically occur upstream of Hudson, New York. Adult Atlantic sturgeon migrate upriver from the ocean between April and early July to spawn above the salt front (Smith 1985, Stegemann 2012). Most female sturgeon move out of the river following spawning but males may remain in the river until October or November.

Based on Utilities fish-monitoring data collected from 2000 through 2009, the majority of larval Atlantic sturgeon were collected between Cornwall and Poughkeepsie (RM 56-76). Within the Hudson River, Atlantic sturgeon in general are most abundant upstream of West Point (RM 47), where 85% of all Atlantic sturgeon were collected during the most recent ten years. Nearly all Atlantic sturgeon collected during Utilities fish monitoring from 2000 through 2009 (97%) were collected in deep, channel habitat at depths greater than 6 meters (20 feet). The vast majority of these fish are considered riverine juveniles and are less than three years old and less than three feet in length. Only 1 Atlantic sturgeon was collected between the Battery and Yonkers (RM 0-23) and no Atlantic sturgeon have been collected during Utilities fish monitoring in the vicinity of the project area since 2000. Similarly, no Atlantic sturgeon were collected during multi-year sampling of interpier and underpier habitats in the lower Hudson River or within interpier areas of the Hudson River Park during sampling conducted between intermittently 1993 and 2004 (Able et al. 1995, Able et al. 1998, Bain et al. 2006).

The preference of shortnose and Atlantic sturgeons for deep-water habitat suggests that it is unlikely that individuals of either species would occur in the vicinity of the Proposed Project except as occasional transients and within the adjacent channel, rather than the shallow off-channel habitat of the project area. Although shortnose sturgeon have been collected from the Hudson River channel south of the George Washington Bridge, the number collected were low, and all but two of the individuals were collected north of Pier 54. Additionally, these recent collections of shortnose sturgeon occurred during the November to April period, when pile driving and removal is prohibited to protect overwintering striped bass. Because water-quality impacts associated with in-water construction activities for the Proposed Project pile driving would be localized, the deep channel habitat preferred by shortnose and Atlantic sturgeon would not be adversely impacted during installation of the piles for the new pier, access ramps, and fender piles. Therefore, the Proposed Project would not adversely affect shortnose and Atlantic sturgeon.

UNDERWATER NOISE ASSESSMENT FOR STURGEON

Only transient subadult and adult shortnose and Atlantic sturgeon are likely to be present in the action area as they migrate to and from foraging, overwintering, and/or spawning grounds. Early life stages and young-of-the-year (YOY) sturgeon will not occur in the action area and will therefore not be affected by in-water construction activities, including underwater noise from pile driving.

For fishes, such as Atlantic and shortnose sturgeon, the peak noise levels associated with the recoverable physiological effects (i.e., 206 dB re: 1μPa SPL_{peak}) are not likely to be experienced during impact pile driving for concrete piles; source levels at the pile would rapidly attenuate from 206 dB to quieter levels beyond 1 foot of the pile. Cumulative underwater noise levels associated with recoverable physiological effects (187 dB re: 1$\mu Pa^2 \cdot$sec SEL_{cum}) would not occur beyond 65 feet for 1 pile and 225 feet for 6 piles. Based on these distances, threshold noise levels will not extend beyond the pierhead line or into the deep waters (>20 feet deep) of the navigation channel where sturgeon most commonly occur. Therefore, sturgeon migrating through the navigation channel and past the project will not be exposed to noise levels that could cause physiological effects.

Because sturgeon are mobile and likely to avoid underwater noise from pile driving, potential exposure to noise levels of 187 dB SEL_{cum} for any occasional transient sturgeon that may occur in the shallow interpier area adjacent to the navigation channel would be limited. A similar determination was made by NMFS in its Biological Opinion for the New NY Bridge at Tappan Zee (NMFS 2013b) in which it was stated that "it is reasonable to conclude that sturgeon will avoid areas in proximity of impact pile-driving operations and are highly unlikely to remain in the vicinity of pile driving long enough to reach the cumulative threshold associated with the potential onset of physiological effects. This is consistent with the analysis and assumptions presented in our 2012 Biological Opinion which assessed the potential for injury using the peak SPL criterion of 206 dB re 1 μPa (rather than the cumulative criterion of 187 dB re 1 $\mu Pa^2 \cdot s$)."

The spatial extent of underwater noise that exceeds 150 dB SPL_{rms} (i.e., threshold for behavioral avoidance by fish) would occur approximately 1,100 feet from the pile during impact pile driving. At that distance, these noise levels will occur across 35% of the river, but only 20% of the deep navigation channel where sturgeon are most likely to occur. Therefore, 80% of the navigation channel will be unobstructed for Atlantic and shortnose sturgeon migrating to and from foraging, overwintering, and/or spawning grounds located upstream of the project's action area. Moreover, the duration of impact pile driving during any given work day is would not exceed 1.5 hours. Therefore, 100% of the navigation channel will be non-ensonified by noise from impact pile driving during the majority (i.e., 22.5 hours) of every day. In addition, pile driving will only occur between May 1 and October 31, further limiting the likelihood of exposure of sturgeon to underwater noise.

Given the results of this analysis, underwater noise generated during impact pile driving for Pier 54 would not adversely affect sturgeon for several reasons. First, the spatial extent of underwater noise associated with recoverable injury for sturgeon would not extend beyond the immediate vicinity of impact pile driving. Second, the duration of impact pile driving would be limited to less than 90 minutes per day and less than six months per year. And lastly, the spatial extent and duration of noise levels associated with behavioral avoidance by sturgeon will be limited and will not deter migrating sturgeon (i.e., a non-ensonified acoustic corridor will exist across 80% of the navigation channel for 150 dB SPL_{rms} noise levels and 100% of the navigation channel for 187 dB SEL_{cum} and 206 dB SPL_{peak} levels). Similar conditions (i.e., small piles, pile driving in shallow water outside of deep waters where sturgeon are mainly found, noise levels below 206 dB SPL_{peak} and 187 dB SEL_{cum} across 100% of the navigation channel) were evaluated for impact pile-driving activities for steel pipe piles at the Port of Coeymans, for which the NYSDEC determined that there would not "likely" be any incidental take for sturgeon (NYSDEC 2014). Similarly, the NMFS determined that, due to the limited spatial and temporal extent of impact driving of steel piles "we do not anticipate any take of shortnose or Atlantic sturgeon resulting from dredging or pile installation at the Coeymans staging area" (NMFS

2014e). For these reasons, it is concluded that there will not be any incidental take for Atlantic or shortnose sturgeon under the ESA and Article 11 of the New York State Environmental Conservation Law as a result of impact pile driving of concrete piles at Pier 54.

F. POTENTIAL IMPACTS TO STRIPED BASS

Striped bass is an anadromous species that occurs along the Atlantic coast from Canada to northern Florida, but is most common from Cape Cod to Cape Hatteras. Some striped bass return to their home rivers to spend the winter while others overwinter in other estuaries or in the warmer coastal waters from New Jersey to North Carolina. Although most migrate to sea, some striped bass adults remain in the Hudson River year-round. In the autumn and winter, these resident adults are joined by migratory adults returning to the estuary to spawn and remain in the lower portion of the estuary until the spawning migration begins in the spring.

In the Hudson River, striped bass spawn at or near the surface of freshwater between West Point and Kingston (RM 44-56) from April to mid-June (NYSDOS 1992, Heimbuch et al. 1994). This spawning area is considerably upriver of Pier 54, which is located near RM 4. The semi-buoyant eggs are typically found in the greatest concentration between mid-May and early June (NYSDOS 1992). Post yolk-sac larvae metamorphose to juveniles in 23 to 68 days. Schools of juveniles move down the estuary along the shore during the summer, feeding on crustaceans and insect larvae at or near the bottom (Heimbuch et al. 1994). Juveniles remain near shore until November or December when they move to deeper water. A significant proportion of juvenile striped bass remains within the lower Hudson Estuary until age two or three when some individuals move out of the estuary along with post-spawn adults to begin coastal migration.

The lower Hudson River, including the area in the vicinity of Pier 54, contains striped bass throughout the year. Striped bass was one of the four most abundant species collected within Hudson River Park from June 2002 through June 2004 (Bain et al. 2006). However, Woodhead (1990) reports greater catches of striped bass in the lower Hudson River off Manhattan from winter until mid-summer. The lower Hudson River Estuary, therefore, provides important wintering habitat (mid-November to mid-April) for young-of-the-year, yearling, and older striped bass (NYSDOS 1992, Heimbuch et al. 1994). In the early spring, striped bass move through the lower Hudson River during upstream passage to spawning grounds.

A number of East Coast states including New York placed restrictions on commercial and recreational fishing for striped bass in the 1980s because of reduced population size. Since that time, the Atlantic stock of striped bass has rebounded and as of 1995 is now considered restored (ASMFC 2010).

During in-water construction activities, temporary and localized increases in suspended sediment and alterations to bottom habitat and benthic macroinvertebrates resulting from the installation of piles for the new pier, access ramps, and fender piles would not result in significant adverse impacts to striped bass. Some area of benthic foraging habitat would be lost in the pile footprints; however, this loss would be minimal and would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish.

G. POTENTIAL IMPACTS TO MARINE TURTLES

Four species of marine turtles, all state and federally listed, can occur in New York Harbor. Juvenile Kemp’s ridley (*Lepidochelys kempii*) and large loggerhead (*Caretta caretta*) turtles regularly enter the New York Harbor and bays in the summer and autumn. The other two species, green sea turtle (*Chelonia mydas*) and leatherback sea turtle (*Dermochelys coriacea*), are usually restricted to the higher salinity areas of the Harbor (USFWS 1997). However, these four turtle species mostly inhabit Long Island Sound and Peconic and Southern Bays. They neither nest in the New York Harbor Estuary, nor reside there year-round (Morreale and Standora 1993). Turtles leaving Long Island Sound for the winter usually do so by heading east to the Atlantic Ocean before turning south (Standora et al. 1990). It is unlikely that these turtle species would occur in the project area except as occasional transient individuals. Because they neither nest, nor reside in the area year-round, and are only rarely observed in this portion of the estuary, they would not be impacted by the construction or operation of the Proposed Project.

UNDERWATER NOISE ASSESSMENT FOR MARINE TURTLES

As determined by the Corps in its Memorandum for the Record issued for the Hudson River Park in 2000, none of the threatened or endangered marine turtles would occur in the vicinity of Pier 54 except as occasional transient individuals. Based on the results of the underwater noise analysis conducted for impact pile driving of concrete piles at Pier 54, those transient turtles that may occasionally occur in the lower Hudson River are not likely to be adversely affected by underwater noise from impact pile driving.

Underwater noise levels associated with recoverable physiological effects to marine turtles (207 dB SPL_{rms}) would not occur during impact pile driving for concrete piles. Source levels within 1 foot of the pile would not exceed 201 dB SPL_{rms} based on this analysis. Therefore, marine turtles will not experience physiological effects caused by impact pile driving at Pier 54.

Underwater noise levels associated with behavioral avoidance by marine turtles (166 dB SPL_{rms}) are not likely to occur beyond a distance of 100 feet from concrete piles during impact pile driving at Pier 54. Because the piles closest to the navigation channel occur at a distance of 300 feet inside the pierhead line, these noise levels will be limited to the interpier area and will not be experienced by transient turtles that may occur as occasional transients in the deeper waters of the navigation channel beyond the pierhead line. Therefore, marine turtles will not experience behavioral effects caused by impact pile driving at Pier 54.

As concluded for sturgeon, underwater noise generated during impact pile driving for Pier 54 would not adversely affect marine turtles due to the limited spatial and temporal extent of noise levels at or above the thresholds for physiological and behavioral effects to turtles. As such, it is concluded that there will be no incidental take of marine turtles as a result of impact pile driving of concrete piles at Pier 54. This determination is consistent with the not-likely-to-affect conclusion issued by the USACE and NMFS in the 2000 Memorandum for the Record issued for the Hudson River Park (USACE 2000).

H. SUMMARY OF EFFECTS ON EFH AND DESIGNATED SPECIES

DIRECT IMPACTS

Direct impacts to EFH and designated species are summarized below.

- Loss of approximately 2,502 square feet (0.06 acres) of benthic habitat and associated benthic invertebrates within the footprints of the piles for the new pier, access ramps, and fender piles. This minimal loss of EFH would not result in significant adverse impacts to designated species, as this would not significantly impact the food supply for fish foraging in the area. In addition, the new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Establishment of the Pier 54 pile field will preserve approximately 84,300 square feet (1.94 acres) of pile field habitat.

- Sediment resuspension during pile installation for the new pier, access ramps, and fender piles. The increase in suspended sediment will be temporary and localized and will not result in significant adverse impacts to designated species.
- Shading of EFH. Although the new pier platform would result in overwater coverage of approximately 2.4 acres, the new pier would be elevated and would allow more light to penetrate underneath the pier than in the existing or No Action conditions. The widths of the access ramps (28 feet wide, 0.3 acres of overwater coverage) would be narrow enough to allow for light penetration. Similarly, the seasonal mooring of the vessel in the vicinity of the amphitheater would also allow for light penetration during the times it is moored at the project site.

INDIRECT IMPACTS

No indirect impacts to EFH are anticipated as a result of the Proposed Project.

CUMULATIVE IMPACTS

In a regional context, the highly urbanized character of the New York Harbor Estuary historically has affected aquatic resources through pollution, habitat loss, and other anthropogenic influences. Despite historic impacts, however, there is evidence that the aquatic resources around the estuary have been improving in recent years, owing to such actions as the implementation widespread water pollution control measures, improvements to fishery harvest management practices, and generally improved environmental awareness since the 1960s. As discussed previously, the results of the NYCDEP Harbor Surveys demonstrate that the water quality of New York Harbor and the Hudson River has improved significantly since the 1970s as a result of measures undertaken by the city. These improvements in water quality, and thus, EFH, are expected to continue in the future due to continued efforts by the city (e.g., control of combined sewer overflows). Additionally, improvements in aquatic habitat and EFH would result from programs implemented by the city, as well as the New York/New Jersey Harbor Estuary Program (HEP), and the Hudson-Raritan Estuary Ecosystem Restoration Project (HRE). The Proposed Project would not adversely affect the continued improvements to water quality of the Hudson River, nor would it affect future improvements in EFH resulting from regional programs such as HEP and HRE, or resulting from other projects along the Hudson River waterfront.

The impacts to benthic habitat would be minimal in terms of the loss of approximately 2,502 square feet of benthic substrate, which would not significantly impact the food supply for fish foraging in the area. The new piles would provide additional attachment sites for algae and sessile invertebrates and some piles may provide suitable refuge to fish. Operational impacts would be minimal. With the Proposed Project, the overwater coverage within Segment 5 of HRP will still be less than overwater coverage authorized by the USACE permit by 3,961 square feet (0.1 acres). The elevation of the new pier would allow for increased light penetration as compared to the existing or No Action conditions. Establishment of the Pier 54 pile field will preserve approximately 84,300 square feet of pile field. Therefore, the Proposed Project would result in positive impacts to EFH and designated species in the Hudson River. Construction-related impacts to water quality would be short-term, localized, and would contribute to long-term changes in water or sediment quality within the project area, or the Hudson River, that would affect EFH or designated species.

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