

21.1 INTRODUCTION

This chapter of the Environmental Impact Statement (EIS) presents the conclusions the Federal Railroad Administration (FRA) and the New Jersey Transit Corporation (NJ TRANSIT) made regarding the consistency of the Hudson Tunnel Project with New York and New Jersey coastal zone policies and potential impacts of the Preferred Alternative on coastal resources under the framework of New Jersey's Coastal Zone Management Rules and New York City's Waterfront Revitalization Program policies. The Port Authority of New York and New Jersey (PANYNJ), in its role as Project Sponsor, has accepted and relied on the evaluations and conclusions of this chapter.

This chapter reflects the following changes made since the Draft EIS (DEIS) for the Hudson Tunnel Project:

- The chapter is updated to describe current conditions in the affected environment and any related updates to the analysis of potential impacts.
- The chapter incorporates design modifications related to the permanent features of the Project (e.g., modifications to surface tracks and tunnel alignment) and changes to construction methods and staging.
- The chapter incorporates the revised conclusions presented in the other chapters of this EIS.
- The chapter reflects the determination by the New Jersey Department of Environmental Protection (NJDEP) dated June 30, 2017, that the Preferred Alternative is consistent with New Jersey's Coastal Zone Management rules.
- The chapter reflects concurrence from the New York State Department of State (NYSDOS) dated January 2, 2019, that the Preferred Alternative is consistent with the New York Coastal Management Program.

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21.2 ANALYSIS METHODOLOGY

During development of this EIS, FRA and NJ TRANSIT developed methodologies for evaluating the potential effects of the Hudson Tunnel Project in coordination with the Project's Cooperating and Participating Agencies (i.e., agencies with a permitting or review role for the Project). The



methodologies used for analysis of consistency of the Project with New Jersey and New York State coastal zone policies are summarized in this chapter.

21.2.1 REGULATORY CONTEXT

21.2.1.1 FEDERAL

The Federal Coastal Zone Management Act (CZMA) of 1972 was established to encourage coastal states to manage development within the states' designated coastal areas to balance conflicts between coastal development and protection of resources within the coastal zone. Requirements for Federal approval of coastal zone management programs and grant application procedures for development of the state programs are included in 15 CFR Part 923, Coastal Zone Management Program Regulations, National Oceanic and Atmospheric Administration (NOAA). Among other things, these regulations authorize states to issue general concurrences for certain activities (40 CFR § 930.53(b)). CZMA requires that Federal activities within a state's coastal zone, including approvals and permits, be consistent with that state's coastal zone management plan. Both New Jersey and New York have Federally approved coastal zone management programs.

21.2.1.2 STATE – NEW JERSEY

The New Jersey Department of Environmental Protection (NJDEP) administers the State of New Jersey's coastal management program through their Coastal Zone Management (CZM) Rules defined at NJAC 7:7. The portion of the Project site within the Hackensack Meadowlands District (as defined by NJSA 13:17-4), is within the New Jersey Coastal Zone. Therefore, the Project must be consistent with the New Jersey CZM Rules in NJAC 7:7. The CZM Rules establish criteria (e.g., acreage limits, regulatory limits, seasonal limitations, and best management practices) for development in special areas (e.g., wetlands, floodplains, aquatic habitat, and regional planning centers), general water area actions (e.g., dredging, bridges, outfalls and intakes), uses (e.g., energy, transportation), and resources (e.g., water quality, fisheries, air quality). The CZM Rules regulate development within the portion of the coastal zone that falls within the Coastal Area Facility Review Act (CAFRA) zone, which does not include the Project site, and the Waterfront Development Area, as described below.

New Jersey's Waterfront Development Act (NJSA 12:5-3) establishes areas within the Hackensack Meadowlands District and the CAFRA zone as Waterfront Development Areas, consisting of tidal waterways up to mean high water (MHW). Outside these two areas, it includes tidal waterways up to MHW, adjacent upland areas within 100 feet of MHW. For properties within 100 feet of MHW that extend inland beyond the 100-foot limit, the regulated waterfront area extends to 500 feet from MHW or to the first paved public road, railroad, or surveyable property line in existence on September 26, 1908 that parallels the waterway, whichever comes first.

21.2.1.3 STATE – NEW YORK

In accordance with the CZMA, New York State adopted its own Coastal Management Program (CMP) in accordance with the New York State Executive Law Article 42: Waterfront Revitalization of Coastal Areas and Inland Waterway Act. The CMP is designed to balance economic development and preservation by promoting waterfront revitalization and water-dependent uses while protecting fish and wildlife, open space and scenic areas, farmland, and public access to the shoreline, and minimizing adverse changes to ecological systems and erosion and flood hazards. The New York State Department of State (NYS DOS) administers the CMP in New York. New York State permits any local government that has any portion of its jurisdiction contiguous to the state's coastal waters to submit a Local Waterfront Revitalization Program (LWRP) to NYSDOS for approval. The NYSDOS reviews a Federal agency's proposed activity (e.g., permit) and

consistency determination, and renders its own decision regarding the consistency of the activity with the CMP. State agencies determine the consistency of their action with the CMP.

21.2.1.4 CITY – NEW YORK

New York City has established an LWRP in accordance with the CZMA and Article 42 of the New York State Executive Law. The New York City’s LWRP 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. The New York City Department of City Planning (NYCDCP) administers New York City’s LWRP.

21.2.2 ANALYSIS TECHNIQUES

FRA and NJ TRANSIT evaluated the Preferred Alternative for consistency with the rules outlined in New Jersey’s CZM Rules defined at NJAC 7:7 and the policies of the New York City LWRP. They reviewed each policy or rule listed in the New Jersey, and New York City coastal management programs for applicability to the Preferred Alternative and then performed a consistency review against the criteria and goals described for each applicable policy or rule.

Following completion of the DEIS, the PANYNJ became the Project Sponsor for the Hudson Tunnel Project (see Chapter 1, “Purpose and Need,” Section 1.1.2, for more information). Consistent with the roles and responsibilities defined in Section 1.1.1 of that chapter, as the current Project Sponsor, the PANYNJ will comply with mitigation measures and commitments identified in the Record of Decision (ROD).

Since publication of the DEIS, the Preferred Alternative has changed from what was presented in the DEIS as a result of design advancement and changes made in response to comments received on the DEIS. Amtrak has continued to advance the design of the Preferred Alternative, including incorporating design refinements based on further engineering analysis and information, resulting in some modifications to the design presented in the DEIS. FRA and NJ TRANSIT, in response to comments made during the public comment period and working with Amtrak and the PANYNJ, have identified ways to reduce the impacts of Project construction, including impacts on local communities near the construction staging areas in New Jersey and Manhattan. These design refinements are described in detail in the Foreword, in Section F.2. In particular, during the public comment period, residents of the Weehawken neighborhood adjacent to the Hoboken staging area—an area that is known as the Shades—and neighboring communities submitted numerous comments. Residents were primarily concerned about the intensive construction activity in close proximity to their neighborhood over a seven-year period, about the timeframe for daily construction activities on the site, and about the heavy truck traffic through Weehawken, where many intersections are congested throughout the day. To address the concerns raised by residents and elected officials in Weehawken and nearby communities, FRA and NJ TRANSIT, working with the Project Partners, have developed a revised construction approach that will reduce the impact to local residents. These design modifications have been reflected in the coastal zone consistency review for the Preferred Alternative presented below.

21.2.3 STUDY AREA

The Project study area for the coastal zone consistency determination comprised all portions of the Project site located within the New Jersey and New York coastal zone boundaries.



21.3 NEW JERSEY COASTAL ZONE CONSISTENCY ASSESSMENT

21.3.1 NEW JERSEY COASTAL ZONE MANAGEMENT (CZM) RULES

The following is an assessment of the applicability of New Jersey CZM Rules to the Preferred Alternative, as defined in NJAC 7:7 CZM Rules (note that this section is organized by rule). An assessment of applicability and consistency with these rules is presented below. NJDEP issued a determination dated June 30, 2017 that the Preferred Alternative is consistent with New Jersey's Coastal Zone Management rules. Where the language in this EIS refers to actions that will be taken by the Project Sponsor, it will be the lead Federal agency's responsibility to ensure the Project Sponsor carries out the specified activities as they will be described in the ROD.

7:7-9.2 Shellfish Habitat

This rule generally limits disturbance of shellfish habitat. The Project site does not contain any shellfish habitat areas. Therefore, this rule is not applicable.

7:7-9.3 Surf Clam Areas

This rule prohibits development that would result in the destruction, condemnation, or contamination of surf clam areas. The Project site does not contain any surf clam areas. Therefore, this rule is not applicable.

7:7-9.4 Prime Fishing Areas

This rule prohibits sand or gravel submarine mining in prime fishing areas which would alter existing bathymetry¹ to a significant degree to reduce fishery productivity, or disposal of domestic or industrial wastes that do not meet applicable effluent limitations and water quality standards. The Project site is not located within a prime fishing area. Therefore, this rule is not applicable.

7:7-9.5 Finfish Migratory Pathways

This rule prohibits development, such as dams or dikes, which would create physical barriers to migratory fish. Development that would lower water quality to interfere with fish movement is also prohibited. Penhorn Creek, within the New Jersey portion of the Project site, is not considered a finfish migratory pathway.

The Hudson River portion of the Project site is a finfish migratory pathway. The in-water ground improvement component of the Preferred Alternative would be constructed within a cofferdam² in the New York portion of the lower Hudson River. This component of the Preferred Alternative has

¹ Bathymetry is the study of the beds or floors of water bodies, including the ocean, rivers, streams, and lakes. The term "bathymetry" originally referred to the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain. (<http://oceanservice.noaa.gov/facts/bathymetry.html>).

² **Cofferdams** are watertight structures designed to facilitate construction projects in areas that are normally submerged. A cofferdam creates an enclosure that surrounds a construction zone and keeps water from entering or leaving. They are typically constructed of sheet piling, which consists of steel sheet sections with intersecting edges that are driven in place similar to piles. They can also be constructed of alternating sections of sheet piling between **king piles**, which in this case are large diameter hollow cylindrical steel piles that provide additional strength and stability to larger cofferdam structures. Cofferdams can be used to allow the construction zone to be dewatered so that the construction area is dry or at a lower level than the surrounding waterbody. They can also be used to contain an area of water to prevent waterborne pollutants from migrating to the surrounding area.

the potential to affect finfish migration due to increases in suspended sediment resulting from the driving and removal of sheet piles for construction of the cofferdam entering New Jersey waters. However, because increases in suspended sediment would be localized and of short duration, dissipating upon cessation of pile driving and removal, it would not pose an obstruction to finfish migration. Turbidity curtains would be deployed during cofferdam removal to further minimize the effects of sediment resuspension. The deep soil mixing of sediment would be contained within the cofferdam throughout the mixing and hardening process, and thus would not result in increased suspended sediment.

Installation of sheet piles and king piles for the cofferdams would result in an increase in underwater noise. This increase in underwater noise would be reduced by driving the sheet pile with a vibratory hammer as recommended by the National Marine Fisheries Service (NMFS), but would reach the level resulting in behavioral effects within 230 feet of each pile being installed. The temporary increases in underwater noise during pile driving would affect a small portion of the Hudson River at any one time and sufficient portions of the Hudson River not affected by pile driving noise would be available such that migration up and down river would not be affected. Water that would be used during the rehabilitation of the North River Tunnel (e.g., dust suppression) and water that would infiltrate into the tunnel would be recovered and conveyed to the sump in the existing Weehawken shaft where it would be treated (e.g., sediment settling tanks and oil/water separation) prior to discharge to the Hudson River through an existing permitted outfall, in accordance with NJDEP New Jersey Pollutant Discharge Elimination System (NJPDES) Permit Number NJ0164640.

For the reasons presented above, the Preferred Alternative would be consistent with this rule.

7:7-9.6 Submerged Vegetation Habitat

This rule prohibits or restricts dredging to protect water areas that support, or previously supported submerged vegetation. The Project site does not contain any NJDEP-mapped submerged vegetation areas. However, the New Jersey State-listed endangered floating marsh-pennywort (*Hydrocotyle ranunculoides*) was observed in the Project site on the south side of the Northeast Corridor (NEC), in North Bergen Township, on November 1, 2016 and in 2019, and at other locations on Penhorn Creek in the vicinity of the Project site in 2019, and is known to occur within the New York, Susquehanna & Western Railway (NYSW) wetland mitigation site. In 2019, NJDEP determined that on the basis of additional populations of floating marsh-pennywort documented in the vicinity of the Project site, the Preferred Alternative would not adversely impact the local population due to the extent of suitable habitat and amount of plants that would be left undisturbed. Therefore, the Preferred Alternative would not result in adverse impacts to floating marsh-pennywort and would be consistent with this rule.

7:7-9.7 Navigation Channels

This rule prohibits development which would result in loss of navigability and construction which would extend into a navigation channel, discourages placement of structures within 50 feet of any authorized navigation channel, and places requirements on maintenance and new dredging. The Preferred Alternative would not hinder navigation within any waterways in New Jersey, nor in the Hudson River navigation channel, which includes the main channel, maintained at a depth of 45 feet, and an adjacent 40-foot-deep channel. The new Hudson River Tunnel alignment would be situated well below the bottom of the Federal navigation channel and other than a 3-acre area of the river bottom where soil would be hardened, tunnel construction would not affect the river. The 3-acre soil improvement with deep soil mixing would occupy a small portion of the navigation channel within New York waters and would meet all requirements of the U.S. Army Corps of Engineers (USACE) to avoid impacts to the Federal navigation channel. All modifications made to the river bottom would be below the authorized depths of the navigation channel, including within



the 0.7 acres of soilcrete that would be elevated 1 to 2 feet above the mudline. As discussed in Chapter 5B, "Transportation Services," Section 5B.7.8, this new hardened area of the river bottom would be designated as a no-anchor zone on navigation charts to ensure that anchor drops do not damage the hardened soil above the tunnel in this area. The no anchor zone would not hinder maritime traffic in the Hudson River. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.8 Canals

This rule prohibits actions that would interfere with existing or proposed boat traffic in canals used for navigation. The Project site does not contain any canals. Therefore, this rule is not applicable.

7:7-9.9 Inlets

This rule prohibits filling and discourages submerged infrastructure in coastal inlets. The Project site does not contain any inlets. Therefore, this rule is not applicable.

7:7-9.10 Marina Moorings

This rule prohibits non-water-dependent development and discourages any use that would detract from existing or proposed recreational boating use in marina mooring areas. The Project site does not contain any marina moorings. Therefore, this rule is not applicable.

7:7-9.11 Ports

This rule prohibits actions that would preempt or interfere with port uses, and prohibits shellfish aquaculture, and dumping of solid waste or semi-solid waste in ports. Neither the construction of the Preferred Alternative nor the permanent condition would interfere with port uses. Therefore, this rule is not applicable.

7:7-9.12 Submerged Infrastructure Routes

This rule prohibits any activity that would increase the likelihood of submerged infrastructure (pipelines, cables) damage or interfere with maintenance operations. No known submerged infrastructure occurs within the Project site. Therefore, this rule is not applicable.

7:7-9.13 Shipwrecks and Artificial Reefs

This rule restricts the use of shipwreck and artificial reef habitat special areas that would significantly adversely affect the usefulness of these special areas as a fish habitat. The Project site does not contain any known shipwrecks or artificial reef habitat special areas. Therefore, this rule is not applicable.

7:7-9.14 Wet Borrow Pits

This rule encourages uses of wet borrow pits which promote wildlife habitat and scenic amenity values, and allows filling of wet borrow pits for construction under certain conditions. The Project site does not contain any wet borrow pits. Therefore, this rule is not applicable.

7:7-9.15 Intertidal and Subtidal Shallows

This rule discourages disturbance of intertidal and subtidal shallows (i.e., permanently or temporarily submerged areas from the spring high tide to a depth of four feet below mean low water). The only intertidal and subtidal shallows within the Project site would be within Penhorn Creek. Activities that would occur within Penhorn Creek would be the installation of drainage infrastructure, such as culvert extensions and stormwater outlets, which are consistent with this rule. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.16 Dunes

This rule protects and preserves dunes that are generally parallel to, and landward of, a beach. The Project site does not contain any dunes. Therefore, this rule is not applicable.

7:7-9.17 Overwash Areas

This rule restricts development in overwash areas due to their sensitive nature. The Project site does not contain any overwash areas. Therefore, this rule is not applicable.

7:7-9.18 Coastal High Hazard Areas

This rule restricts development in coastal high hazard areas³, and areas within 25 feet of oceanfront shore protection structures subject to wave run-up and overtopping.

As described in Chapter 11, "Natural Resources," Section 11.3.1.1, the Project site contains coastal high hazard areas along the shoreline of the Hudson River. The Federal Emergency Management Agency (FEMA) has mapped this portion of the Project site as having a 100-year flood elevation, or Base Flood Elevation (BFE) of +16 feet North American Vertical Datum 1988 (NAVD88), Zone VE⁴, subject to additional hazards due to storm-induced velocity wave action, a 3-foot or higher breaking wave. Because the Preferred Alternative in this location would include only the new tunnel which would be approximately 100 feet below the Hudson River bottom in this area, no development within the coastal high hazard area would occur. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.19 Erosion Hazard Areas

This rule prohibits development on shorelines that are eroding and/or have a history of erosion, except for linear developments, shore protection activities, and single-story beach and tourism-oriented development that meets certain requirements. The Project site is not located within any erosion hazard areas. Therefore, this rule is not applicable.

7:7-9.20 Barrier Island Corridors

This rule restricts new development on barrier island corridors (i.e., the interior portions of oceanfront barrier islands, spits, and peninsulas upland of beaches, wetlands, dunes, and water). This rule restricts new development on barrier islands. The Project site does not contain barrier island corridors. Therefore, this rule is not applicable.

7:7-9.21 Bay Islands

This rule restricts development on bay islands. The Project site does not contain any bay islands. Therefore, this rule is not applicable.

7:7-9.22 Beaches

This rule restricts development on beach areas. The Project site does not contain any beaches. Therefore, this rule is not applicable.

³ Coastal high hazard areas are those portions of the 100-year floodplain subject to high velocity waters, which correspond to FEMA V zones (i.e., areas along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves),

⁴ FEMA VE Zones are areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action, which also have Base Flood Elevations (BFEs) derived from detailed hydraulic analyses shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.



7:7-9.23 Filled Water's Edge

This rule seeks to promote water-dependent uses at areas along the waterfront that comprise previously filled water, wetlands or upland areas lying between wetlands or water areas. The existing NEC surface tracks in the Meadowlands (west of Tonnelle Avenue), bordering Penhorn Creek and the wetland areas, are considered filled water's edge. However, promotion of waterfront uses is not compatible with safe operation and management of a railroad and rail corridor. Therefore, the Preferred Alternative cannot provide access for water-dependent uses along the NEC surface tracks; and this rule is not applicable.

7:7-9.24 Existing Lagoon Edges

This rule restricts development at lagoon edges because of potential water quality problems if the edge is not stabilized. The Project site does not contain any existing lagoon edges. Therefore, this rule is not applicable.

7:7-9.25 Flood Hazard Areas

This rule is intended to restrict development in undeveloped flood hazard areas, to ensure that development within the flood hazard areas (as defined under the Flood Hazard Area Control Act, NJSA 58:16A-50 et seq., implementing rules at NJAC 7:13) conforms to applicable design and construction standards, complies with the requirements for impervious cover and vegetative cover and endangered or threatened wildlife or plant species habitats, and that the waterfront is not preempted by uses that could function equally well at inland locations. As described in Chapter 11, "Natural Resources," the proposed new surface alignment through the Meadowlands and the proposed Hoboken ventilation shaft and fan plant site would be within the FEMA 100-year floodplain. Because the existing NEC is located within the 100-year floodplain, and the new surface alignment must connect to it, there is no alternative to locating the surface alignment within the 100-year floodplain. All components of the Preferred Alternative, would be designed using a Design Flood Elevation (DFE) that is 5 feet higher than the BFE. Moreover, when Project elements can be designed without substantial financial implications to a more conservative standard, they will be. As currently designed, the Preferred Alternative's surface alignment would be on a retained fill embankment and viaduct that are a minimum of 15 feet above the BFE and would also be above the 500-year flood elevation. The new tunnel portal at Tonnelle Avenue would not fall within the 100-year floodplain but would be slightly below the DFE. However, the adjacent approach tracks and surrounding areas would be above the DFE. Soil berms and other design features would be included in the Project at this location to prevent floodwater from entering the tunnel.

Much of the Project site east of the Palisades is within the 100-year floodplain. Because the new tunnel under the Palisades and Hoboken waterfront needs to connect to Penn Station New York (PSNY), there is no option to locate the fan plant outside the 100-year floodplain. The Hoboken ventilation shaft and associated fan plant would be located within the 100-year floodplain, but would be designed to comply with the Project's DFE criterion, which requires that critical equipment in the fan plant be raised above the DFE.

In order to connect with the existing NEC in Secaucus, New Jersey and PSNY, portions of the Preferred Alternative must be located within the 100-year floodplain. The Preferred Alternative has been designed to avoid potential impacts to the NEC due to flooding under current conditions and in the future with sea level rise. Additionally, the occupation of the floodplain by the Preferred Alternative's surface alignment would not result in increased flooding of adjacent areas because the source of the flooding is tidal.

Therefore, the Preferred Alternative would be consistent with this rule and the rules at NJAC 7:13.

7:7-9.26 Riparian Zones

This rule regulates development in a riparian zone. A riparian zone exists along both sides of every regulated water, and includes the water itself. Regulated waters are defined in the Flood Hazard Area Control Act rules at NJAC 7:13-2.2. The riparian zone for the Hudson River is 50 feet. The Hoboken staging and fan plant site is greater than 50 feet from the Hudson River and is, therefore, outside the riparian zone.

As discussed in Chapter 11, "Natural Resources," NJDEP identified Penhorn Creek as a known location for the floating marsh-pennywort, a state-listed endangered plant, which was observed in November 2016 and again in 2019, and at other locations on Penhorn Creek in the vicinity of the Project site in 201. The presence of endangered and threatened species establishes a riparian zone of 150 feet for Penhorn Creek. Implementation of Preferred Alternative elements within the riparian zone would comprise the construction of the retained fill embankment, retaining walls, storm sewer and outfalls, and culverts and culvert extensions. While these elements of the Preferred Alternative would disturb approximately 5 acres of riparian zone, these elements would not adversely affect the floodplain and would not result in adverse impacts to water quality of the creek. Erosion and sediment control measures would be implemented during construction of the Preferred Alternative to minimize discharge of sediment to Penhorn Creek during construction. Construction of culvert extensions would include the installation of a temporary cofferdam and sump pits to divert Penhorn Creek water flow around the work area to control infiltration of groundwater during placement and anchoring of culverts or extensions. Water removed during cofferdam dewatering would be treated with temporary sediment control measures that the Project Sponsor will develop in consultation with NJDEP (e.g., sediment control basin) before being discharged back to Penhorn Creek. The culvert extensions would be designed to accommodate the design flow of the existing culverts. All riparian zone vegetation associated with Penhorn Creek and its tributaries that would be temporarily disturbed by the Project would be replanted in accordance with N.J.A.C. 7:11.2(z) immediately following construction. Additionally, the Project Sponsor would develop a Riparian Zone Mitigation Plan in coordination with NJDEP for the approximately 5 acres of riparian zone impacts above the allowable impact thresholds defined in Table 11.2 of the Flood Hazard Area Control Act at N.J.A.C. 7:13. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.27 Wetlands

This rule restricts disturbance in wetland areas and requires mitigation if wetlands are destroyed or disturbed. The Preferred Alternative would result in the unavoidable permanent loss of 4.4 acres of emergent wetlands and associated open water habitats due to the placement of retained fill, retaining walls, viaduct piles, bridge abutments, permanent access road, culverts, and culvert extensions in and near the Meadowlands and within the footprint of a construction access road in Hoboken, as discussed in Chapter 11, "Natural Resources," Section 11.7.2.2. During construction, installation of erosion and sediment control measures and security fencing would result in temporary impacts during construction to approximately 1.5 acres of emergent wetlands and associated open water areas within the emergent wetlands along the surface tracks of the Preferred Alternative (see Section 11.6.2.2 in Chapter 11). Following completion of construction, the Project Sponsor will restore wetlands temporarily affected during construction by restoring the original topography and stabilizing with mulch, straw, or hay. Because the surface alignment must connect to the existing NEC, which is located adjacent to freshwater wetlands, there is no alternative to locating certain components of the surface alignment within freshwater wetlands. Indirect impacts to the wetlands would be reduced by maintaining drainages within the wetlands and designing the culverts so that changes to hydrology, and subsequently wetlands, are minimized. Flow diversions associated with the temporary cofferdams, relocation of the Penhorn Creek tributary south of the NEC near the twin 48-inch culvert and sediment control measures for

construction of the culverts would be temporary, and water flow would be restored following removal of these features upon the completion of construction. Mitigation for direct and indirect wetland impacts would be determined in consultation with NJDEP and the USACE, but would likely include the purchase of mitigation credits from an approved mitigation bank within the same watershed(s) as the Project site. Additionally, a new weir would be installed downstream of the twin 48-inch culvert extension to maintain surface water elevations in the upstream portion of Penhorn Creek and associated wetlands. With the implementation of approved mitigation measures, the Preferred Alternative would not result in adverse impacts to wetlands.

7:7-9.28 Wetlands Buffers

This rule restricts development in wetland buffer areas to protect wetlands. A portion of Penhorn Creek falls within the Project site, and is within the Hackensack Meadowlands District, where the wetlands buffer requirement does not apply. Therefore, this rule is not applicable.

7:7-9.29 Coastal Bluffs

This rule restricts development on coastal bluffs, except for linear development which meets certain requirements. The Project site does not contain any coastal bluffs. Therefore, this rule is not applicable.

7:7-9.30 Intermittent Stream Corridors

This rule restricts actions in intermittent stream corridors. The Project site does not contain any intermittent stream corridors. Therefore, this rule is not applicable.

7:7-9.31 Farmland Conservation Areas

This rule seeks to preserve large contiguous areas of land actively used or suitable for use for farming. The Project site does not contain any Farmland Conservation Areas. Therefore, this rule is not applicable.

7:7-9.32 Steep Slopes

This rule discourages development on steep slopes adjacent to wetlands, wetland buffers, intermittent stream corridors, threatened or endangered species habitats, riparian zones, or water areas. Development on steep slopes not adjacent to those areas must meet certain requirements with respect to vegetation and stabilization. Steep slopes are land areas with slopes greater than 15 percent, which are not adjacent to the shoreline and therefore not coastal bluffs (see NJAC 7:7-9.29). Steep slopes include natural swales and ravines, as well as man-made areas, such as those created through mining for sand, gravel, fill, or road grading. This rule discourages development on steep slopes where wetlands, wetland buffers, intermittent stream corridors, threatened and endangered species habitats, riparian zones, or water areas are located adjacent to or at the base of the slope and on steep slopes that are forested as defined by NJAC 7:7-13.5(c) unless stabilization measures that are consistent with the natural or predevelopment character of the entire site are used.

The Preferred Alternative's retained fill sections supported by the retaining wall located in Secaucus, New Jersey, between County Road and a point approximately 550 feet east of Secaucus Road, would be designated steep slopes under this rule. For reasons discussed above under Rule 7:7-9.27, locating the new surface track in or adjacent to wetlands is unavoidable due to the need to connect to the NEC and PSNY. These surface track elements have been designed in accordance with engineering design and construction practices to be stable and to minimize the potential for discharges to adjacent wetlands or streams. As described in Chapter 3, "Construction Methods and Activities," examples include designing the retaining walls with foundations

supported by deep piles, and the use of surcharging to compact the soil for the retained fill embankment. Therefore, the Preferred Alternative is consistent with this rule.

7:7-9.33 Dry Borrow Pits

This rule restricts the excavation and filling of dry borrow pits. The Project site does not contain any dry borrow pits. Therefore, this rule is not applicable.

7:7-9.34 Historic and Archaeological Resources

This rule protects historic and archaeological resources and may require cultural resource surveys and other protective measures. As discussed in Chapter 9, "Historic and Archaeological Resources," FRA has completed consultation in accordance with Section 106 of the National Historic Preservation Act. Section 106 regulations require that FRA identify historic properties listed in or eligible for listing in the National Register of Historic Places within the Project's Area of Potential Effects (APE); assess effects to historic properties; avoid, minimize, or mitigate any adverse effects; and consult with the relevant State Historic Preservation Officer (SHPO), which for the Hudson Tunnel Project are the New Jersey Historic Preservation Office (NJHPO) and New York State Historic Preservation Office (NYSHPO). For the portion of the APE in New Jersey, FRA determined through the Section 106 process, with NJHPO concurrence, that the Preferred Alternative would have adverse effects on the Pennsylvania Railroad New York to Philadelphia Historic District and North River Tunnel. The Preferred Alternative also has the potential for adverse effect as a result of accidental construction damage on two historic properties near the Project site in New Jersey, Substation No. 3 in North Bergen and the Bergen Portal (the portal for the North River Tunnel) in North Bergen.

In addition, Project-related ground improvement or underpinning east of the Hoboken staging area would have the potential to affect an area of moderate to high archaeological sensitivity for a historic sea wall just east of the Hoboken staging area in New Jersey.

In accordance with 36 CFR § 800.14(b)(3), FRA developed detailed measures to avoid, minimize, and/or mitigate adverse effects that are included in a Section 106 Programmatic Agreement (PA). These measures were developed through consultation between FRA, NJHPO, NYSHPO, the Advisory Council on Historic Preservation, the Federal Transit Administration (FTA), Amtrak, and the PANYNJ, as well as other consulting parties to the PA as part of the Section 106 process. The PA is provided in Appendix 9 to the FEIS.

Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.35 Specimen Trees

This rule seeks to protect specimen trees, as defined by NJDEP. Specimen trees are defined as "the largest known individual trees of each species in New Jersey" or trees "with a circumference equal to or greater than 85 percent of the circumference of the record tree." The Project site does not contain any specimen trees. Therefore, this rule is not applicable.

7:7-9.36 Endangered or Threatened Wildlife or Vegetation Species Habitats

This rule prohibits development of endangered or threatened wildlife or plant species habitat, unless it can be demonstrated that endangered or threatened wildlife or plant species habitat would not be directly or indirectly affected by the development.

As discussed in Chapter 11, "Natural Resources," in 2021 the New Jersey Natural Heritage Program (NJNHP) identified the following threatened, endangered, special concern, and rare species, wildlife habitats, and ecological communities as having the potential to occur within the Project site or its vicinity: glossy ibis (*Plegadis falcinellus*; special concern), little blue heron (*Egretta caerulea*; special concern), osprey (*Pandion haliaetus*; threatened), snowy egret (*Egretta*

thula; special concern), yellow-crowned night-heron (*Nyctanassa violacea*; threatened), shortnose sturgeon (*Acipenser brevirostrum*; endangered), Atlantic sturgeon (*Acipenser oxyrinchus*, endangered), black-crowned night-heron (*Nycticorax nycticorax*; threatened), barn owl (*Tyto alba*; special concern), and floating marsh-pennywort (*Hydrocotyle ranunculoides*; endangered). Shortnose and Atlantic sturgeon would only occur in the Hudson River.

The NJDEP's Landscape Project – Piedmont Plains database identified the Project site as foraging habitat for little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), yellow-crowned night-heron (*Nyctanassa violacea*), and glossy ibis (*Plegadis falcinellus*) (NJDEP 2021).

The Preferred Alternative would result in the relocation of the Penhorn Creek tributary east of Secaucus Road, containing documented populations of the state-listed endangered floating marsh-pennywort. The Preferred Alternative would also result in permanent impacts to the NYSW wetland mitigation site where floating marsh-pennywort has also been documented. As discussed in Chapter 11, "Natural Resources," Sections 11.6.2.6 and 11.7.2.6, in 2019, NJDEP determined that on the basis of additional populations of floating marsh-pennywort documented in the vicinity of the Project site, the Preferred Alternative would not adversely impact the local population due to the extent of suitable habitat and amount of plants that would be left undisturbed. Floating marsh-pennywort thrives in stagnant and slow-moving waters, such as those within a storm water drainage swale. Therefore, the Preferred Alternative would not result in adverse impacts to floating marsh-pennywort.

Construction of the Preferred Alternative would occur within wetlands that serve as potential nesting and/or foraging habitat for state-listed birds, including glossy ibis, little blue heron, osprey, snowy egret, yellow-crowned night heron, and black-crowned night heron. The barn owl is also considered to have the potential to occur in the wetlands around Penhorn Creek at any time of year. The 4.4 acres of emergent wetland and associated open water habitat that would be lost as a result of construction of the Preferred Alternative in New Jersey would represent a negligible reduction in the amount of overall similar habitat available to these species in the vicinity and would not impact the size or viability of their local populations. An abundance of interior wetland habitat surrounding Penhorn Creek would remain following the construction of the Preferred Alternative, and glossy ibis, little blue heron, osprey, snowy egret, yellow-crowned night heron, black-crowned night heron, and barn owl would all have the same potential to occur in this area as at present. As described in Chapter 11, "Natural Resources," and above under NJAC 7:7-9.27, the culverts and new weir would be designed to minimize indirect impacts to wetlands due to changes in wetland hydrology, and construction impacts would be temporary. Therefore, the Preferred Alternative would not result in adverse impacts to wildlife habitat and wildlife. The wetlands would continue to support the same assemblage of wildlife species as at present.

To minimize the potential for impacts to birds potentially using wetland habitat that would be affected by Preferred Alternative construction, the Project Sponsor will require that vegetation clearing and/or initial placement of fill material would not occur in the primary breeding period for most bird species (April through July) and would instead occur between October 1 and March 14 (i.e., prior to or after the breeding season) to prevent birds from attempting to breed where additional construction activity would later occur. These measures would avoid any potential direct impacts to the threatened or special concern species of birds that could nest or forage within the wetlands around Penhorn Creek.

No listed species of wildlife are considered to have the potential to occur near the fan plant or new or existing Palisades tunnel portals, and therefore, operation of these elements of the Preferred Alternative would not have any impacts to such species.

For the reasons discussed above, the Preferred Alternative would be consistent with this rule.

7:7-9.37 Critical Wildlife Habitats

Critical wildlife habitats are specific areas known to serve an essential role in maintaining wildlife, particularly in wintering, breeding, and migrating. This rule discourages development that would adversely affect critical wildlife habitats unless minimal feasible interference with the habitat can be demonstrated, there is no prudent or feasible alternative location for the development, and the proposal includes appropriate mitigation measures.

As described in Chapter 11, “Natural Resources,” the New Jersey Meadowlands, where the Preferred Alternative’s surface tracks would be located, is well known for its large complex of tidal marshes and impounded wetlands that have been documented to provide habitat for many resident and migratory species, including some species that have been listed by state or Federal regulatory agencies as being of special concern, threatened, or endangered. Results from consultations with New Jersey Natural Heritage Program and NJDEP’s Landscape Project have identified colonial nesting birds, such as great egret (*Ardea alba*), snowy egret (*Egretta thula*), and glossy ibis (*Plegadis falcinellus*) as having the potential to occur in or adjacent to the Project site. The wetland habitat surrounding Penhorn Creek has also been documented as providing habitat for many resident and migratory species, including some species that have been listed by state or Federal regulatory agencies as being of special concern, threatened, or endangered. The 4.4 acres of emergent wetland and associated open water habitat in New Jersey that would be lost would represent a negligible reduction in the amount of such habitat available to these species in the area and would not impact the size or viability of their local populations. An abundance of interior wetland habitat surrounding Penhorn Creek would remain following completion of the Preferred Alternative, and colonial nesting birds would all have the same potential to occur in this area as at present. Additionally, the 4.4-acre loss would be mitigated for by the Project Sponsor’s purchase of acre-credits, as described in Appendix 11-4, “Conceptual Compensatory Mitigation Plan.” The Project site within New Jersey waters of the Hudson River is within NMFS-designated Essential Fish Habitat; however, because there is no in-water work in New Jersey waters of the Hudson River, there would not be an adverse impact to this critical wildlife habitat.

Additional measures would be taken to minimize impacts to critical habitat areas resulting from construction. Implementation of erosion and sediment control measures (e.g., hay bales and silt fences) in accordance with the Stormwater Pollution Prevention Plan (SPPP) prepared in accordance with the NJPDES General Permit NJ0088323 for Construction Activity Stormwater would minimize indirect impacts to wetlands. Following the completion of construction, disturbed wetlands would be restored back to original topography and stabilized in accordance with the SPPP.

With these measures in place, the Preferred Alternative would be consistent with this rule.

7:7-9.38 Public Open Space

This rule encourages new public open spaces and discourages development that might adversely affect existing public open space. Construction of the Preferred Alternative would not require physical disruption of any parks, open spaces, or recreational resources in New Jersey. Ten parks or recreational resources are located near the proposed Project alignment in New Jersey, as discussed in Chapter 8, “Open Space and Recreational Facilities.” As shown in Figure 8-1 in Chapter 8, these include: Paterson Plank Road Park in North Bergen, Firefighters’ Memorial Park in Union City, Pizzuta Park and the 19th Street Basketball Courts in Weehawken, and 1600 Park, Harborside/Hoboken Cove Park, and the Hudson River Waterfront Walkway in Hoboken and Weehawken. At these parks, noise from construction activities related to the Preferred Alternative would potentially be disruptive, but would not adversely affect recreational use of the parks. The Project Sponsor will implement mitigation measures to reduce noise levels at construction sites, which will also reduce disruption to recreational users at nearby parks, as discussed in Chapter



12A, "Noise." In addition, the Project Sponsor will coordinate the City of Hoboken and Township of Weehawken during one particularly noisy activity, pile installation, near three of the parks, so as to avoid disruption to special events in those parks and to provide advance notification so that the city and township can notify the public.

Operation of the new Hudson River Tunnel would not affect the public's use and enjoyment of parks in the study area. The new tunnel would be deep below the parks and rail operations would not be discernible. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.39 Special Hazard Areas

This rule defines special hazard areas as those with a known actual or potential hazard to public health, safety, and welfare, which includes areas where hazardous substances are used or have been disposed. As described in Chapter 16, "Contaminated Materials," the Preferred Alternative would include construction of two additional tracks parallel to the existing NEC. Construction of the new Hudson River Tunnel, surface tracks, and associated structures such as the retained fill embankment, retaining walls, buildings, viaduct foundations, and access roads would result in subsurface disturbances. Demolition of existing structures or equipment and rehabilitation of the existing North River Tunnel, potentially contaminated with asbestos-containing materials, lead-based paint, electrical equipment containing polychlorinated biphenyls (e.g., transformers and ballasts) and other contaminated materials, would also occur. Current and historical uses along the Project site include industrial, commercial, transportation (including railroad), and residential uses. Contaminated soil and groundwater resulting from these uses is likely to be encountered at various locations during construction. Phase II Site Investigation soil and groundwater sampling activities, as well as hazardous materials building investigations, will be performed at selected sites along the Project site where the potential for contamination exists. Based on the findings of these initial investigations, additional investigations may be undertaken to further determine the extent and levels of contamination at the affected properties. Any contaminated materials encountered during construction would be managed according to a Project-wide Soils and Materials Management Plan (SMMP). The transportation and disposal of contaminated material would be conducted in accordance with Federal, state, and local regulations. A Soil Erosion and Sediment Control Plan would be submitted to the Hudson-Essex-Passaic Soil Conservation District for proposed construction activities, and appropriate approvals and permits would be obtained from the New Jersey Sports and Exhibition Authority (NJSEA). Following construction, the disturbed areas would be restored to pre-construction conditions or capped. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.40 Excluded Federal Lands

Federal lands are beyond the jurisdiction of the New Jersey Coastal Zone. New Jersey has the authority to review activities on Federal lands if spillover impacts on New Jersey's Coastal Zone may occur. The Project site does not include any excluded Federal lands. Therefore, this rule is not applicable.

7:7-9.41 Special Urban Areas

Special urban areas are those municipalities qualified to receive State aid to enable them to maintain and upgrade municipal services and offset local property taxes. The Project site falls within several special urban areas, including Hoboken and North Bergen, New Jersey. The Preferred Alternative would strengthen the area's rail transportation capacity and functionality, which is critical as it supports intercity, regional, and local mobility and associated economic benefits regionally and nationally. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.42 Pinelands National Reserve and Pinelands Protection Area

This rule allows the Pinelands Commission to serve as the reviewing agency for actions within the Pinelands National Reserve. The Project site does not fall within the Pinelands National Reserve. Therefore, this rule is not applicable.

7:7-9.43 Hackensack Meadowlands District

This rule allows the NJSEA to serve as the reviewing agency for actions within the Hackensack Meadowlands District. The surface alignment of the Preferred Alternative is located within the Hackensack Meadowlands District. The NJSEA has been and will continue to be involved in the review of the Hudson Tunnel Project. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.44 Wild and Scenic River Corridors

This policy recognizes the value of rivers designated or under study for designation into the National Wild and Scenic Rivers System by prohibiting development that would have direct and adverse effect on any “outstandingly remarkable resource value” for which the river was designated or is being studied for designation. The Project site does not fall within any wild and scenic river corridors. Therefore, this rule is not applicable.

7:7-9.45 Geodetic Control Reference Marks

This rule discourages disturbance of geodetic control reference marks and monuments. Geodetic survey markers within the Project site would be identified and avoided to the maximum extent practicable. Protective measures, such as hay bales or fencing, would be placed around the markers if feasible. Should any markers need to be moved, raised, or lowered, the appropriate 60-day notice would be filed prior to disturbance. With these measures in place, the Preferred Alternative would be consistent with this rule.

7:7-9.46 Hudson River Waterfront Area

This policy restricts development along the Hudson River waterfront and requires development, maintenance, and management of a section of the Hudson River Waterfront Walkway coincident with the shoreline of the development property. With the Preferred Alternative, the new tunnel alignment would pass beneath the Hudson River Waterfront Walkway in Hoboken, but would be approximately 100 feet below the surface and would not constitute development in this area. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.47 Atlantic City

This policy applies to development in Atlantic City, New Jersey. The Project site is not within Atlantic City. Therefore, this rule is not applicable.

7:7-9.48 Lands and Waters Subject to Public Trust Rights

Lands and waters subject to public trust rights are tidal waterways and their shores, and lands now or formerly below the mean high water line, and shores above the mean high water line. This rule reserves the public’s rights of access to and use of tidal waterways and their shores.

Penhorn Creek is a tidal water body that is regulated by a tide gate at St. Paul’s Avenue near its mouth. The Preferred Alternative would not result in an impact to existing public trust rights within Penhorn Creek nor interfere with these rights in the future, although the Preferred Alternative would require coordination with the New Jersey Bureau of Tidelands Management for activities within Penhorn Creek tidelands. The primary elements of the Preferred Alternative within and



along the shoreline of Penhorn Creek include a retained fill embankment, storm sewer and outfalls, and culvert extensions. These Project elements would not affect public rights.

In addition, the tunnel alignment for the Preferred Alternative would be located beneath the tidal waterway of the Hudson River. NJ TRANSIT would obtain riparian rights for the use of this underwater land on behalf of the Project, as appropriate. This would not affect the public's use of this public trust land.

Therefore, the Preferred Alternative would be consistent with this rule.

7:7-9.49 Dredged Material Management Areas

A dredged material management area is an area documented as having been previously used for the placement of sediment associated with the dredging of state and/or Federal navigation channels and marinas. The Project site does not contain any dredged material management area. Therefore, this rule is not applicable.

7:7-12.2 Shellfish Aquaculture

This rule promotes shellfish aquaculture in all general water areas defined at NJAC 7:7-12.1, provided it does not conflict with other marine uses, present a hazard to navigation, or cause adverse environmental impacts. The Project site does not contain shellfish habitat. Therefore, this rule is not applicable.

7:7-12.3 Boat Ramps

This rule dictates where boat ramps are acceptable. The Preferred Alternative does not involve construction of boat ramps. Therefore, this rule is not applicable.

7:7-12.4 Docks and Piers for Cargo and Commercial Fisheries

This rule outlines development guidelines for docks and piers for cargo and commercial facilities. The Preferred Alternative does not involve construction of docks and piers for cargo and commercial facilities. Therefore, this rule is not applicable.

7:7-12.5 Recreational Docks and Piers

This rule outlines the requirements for construction of recreational docks and piers. The Preferred Alternative does not involve construction of recreational docks and piers. Therefore, this rule is not applicable.

7:7-12.6 Maintenance Dredging

This rule outlines the requirements for maintenance dredging projects. The Preferred Alternative does not involve maintenance dredging. Therefore, this rule is not applicable.

7:7-12.7 New Dredging

This rule outlines the requirements for new dredging activities. The Preferred Alternative would not require new dredging. Therefore, this rule is not applicable.

7:7-12.8 Environmental Dredging

This rule outlines the requirements for environmental dredging activities. The Preferred Alternative would not require environmental dredging. Therefore, this rule is not applicable.

7:7-12.9 Dredged Material Disposal

This rule sets the standards for dredged material disposal. The Preferred Alternative would not involve dredged material disposal therefore, this rule is not applicable.

7:7-12.10 Solid Waste or Sludge Dumping

This rule prohibits the dumping of solid or semi-solid waste of any type in any general water area. The Preferred Alternative would not involve the dumping of any solid waste or sludge. Therefore, this rule is not applicable.

7:7-12.11 Filling

Filling is the deposition of material including, but not limited to, sand, soil, earth, and dredged material into water areas for the purpose of raising water bottom elevations to create land areas. This rule generally discourages filling in water areas, except for certain conditionally acceptable circumstances.

As discussed above under Rule 7:7-9.27, Wetlands, the Preferred Alternative would result in the unavoidable loss of 4.4 acres of freshwater wetlands and associated open water habitat due to the placement of retaining fill, retaining walls, viaduct, bridge abutments, permanent access road, culverts and culvert extensions in and near the Meadowlands and within the footprint of a construction access road in Hoboken. In addition, as discussed in Chapter 11, "Natural Resources," Section 11.6.2.2, during construction the Preferred Alternative would also result in temporary impacts to approximately 1.5 acres of emergent wetlands and associated open water areas along the surface tracks in the Meadowlands from the installation of erosion and sediment control measures and security fencing. Following the completion of construction, wetlands temporarily affected during construction would be restored back to original topography and stabilized. Because the surface alignment must connect to the existing NEC, which is located adjacent to freshwater wetlands, there is no alternative to locating certain components of the surface alignment within freshwater wetlands. Indirect impacts as a result of this fill would be reduced by maintaining drainages within the wetlands. As described in Chapter 11, "Natural Resources," the Project Sponsor will determine mitigation for direct and indirect wetland impacts as a result of filling in consultation with NJDEP and USACE, which would likely include the purchase of mitigation credits from an approved mitigation bank within the same watershed as the impacted site. Additionally, a new weir would be installed downstream of the twin 48-inch culvert extension to maintain surface water elevations in the upstream portion of Penhorn Creek and associated wetlands. With the implementation of approved mitigation measures, the Preferred Alternative would not result in adverse impacts to wetlands. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-12.12 Mooring

This rule outlines circumstances under which moorings are conditionally acceptable. The Preferred Alternative would not involve boat mooring. Therefore, this rule is not applicable.

7:7-12.13 Sand and Gravel Mining

This rule generally discourages sand and gravel mining in all water body types. The Preferred Alternative would not involve sand and gravel mining. Therefore, this rule is not applicable.

7:7-12.14 Bridges

This rule states that bridges are conditionally acceptable provided: (1) There is a demonstrated need that cannot be satisfied by existing facilities; (2) Pedestrian and bicycle use is provided for unless it is demonstrated to be inappropriate; and (3) Fishing catwalks and platforms are provided to the maximum extent practicable. This shall be taken into consideration during the design phase of all proposed bridge projects. The Preferred Alternative would include an approximately 3,100-foot-long viaduct that would cross over wetlands, beginning approximately 550 feet east of Secaucus Road in North Bergen, New Jersey, with an adjacent bridge that would extend over the NYSW and Conrail tracks just west of Tonnelle Avenue. A 315-foot-long segment of the



permanent access road would be an elevated trestle over the relocated Penhorn Creek tributary just east of the twin 48-inch culvert near Secaucus Road. The need for the new surface tracks and the viaduct is described in Chapter 1, "Purpose and Need." The 315-foot-long trestle is included to reduce impacts to the wetlands and waterways below it and avoid the culverting of a portion of the Penhorn Creek tributary. Pedestrian, bicycle, and fishing uses are not compatible with the safe operation of rail traffic on this viaduct or trestle section of the access road. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-12.15 Submerged Pipelines

This rule outlines the circumstances under which submerged pipelines are conditionally acceptable. The Preferred Alternative would not involve construction of submerged pipelines. Therefore, this rule is not applicable.

7:7-12.16 Overhead Transmission Lines

This rule outlines when overhead transmission lines over water bodies are acceptable. The Preferred Alternative would not construct overhead transmission lines over water bodies. Therefore, this rule is not applicable.

7:7-12.17 Dams and Impoundments

This rule generally prohibits dams and impoundments except for within medium rivers, creeks, and streams. The Preferred Alternative would not involve construction of dams or impoundments. Therefore, this rule is not applicable.

7:7-12.18 Outfalls and Intakes

Outfalls and intakes are pipe openings that are located in water areas for the purpose of intake of water or discharge of effluent including sewage, stormwater, and industrial effluents. Outfalls and intakes are conditionally acceptable, provided that the use associated with the intake or outfall meets applicable requirements of this rule.

The Preferred Alternative would maintain the long-term function and conveyance of all crossing and adjacent watercourses. The Preferred Alternative would extend the existing culverts in Penhorn Creek that currently cross underneath the existing NEC's surface alignment prior to placement of fill material for the new retaining wall at the western end of the surface alignment and for the new retaining wall east of Secaucus Road. The existing twin 48-inch culvert that carries Penhorn Creek under the NEC east of Secaucus Road would be extended under the new embankment. This twin culvert serves as the outlet for the large wetland area located north of the NEC.

In the DEIS design, the Penhorn Creek tributary near Secaucus Road passed beneath the new surface access road in a culvert. Since publication of the DEIS, the design has advanced such that the culvert is no longer required. Instead, the Penhorn Creek tributary would be relocated. It would remain open, passing under the access road along the railroad embankment wall. The relocated portion of the Penhorn Creek tributary would be a trapezoidal channel with a natural bottom. The access road would be elevated on a trestle for approximately 315 feet from the right bank of Penhorn Creek to the end of the railroad embankment retaining wall and would comprise open grid steel grating. The inoperable pump station would be demolished and removed, and the weir just south of the NEC would be removed and a new weir installed. The existing culverts beneath the NEC are critical drainage elements that would be carefully maintained during culvert extension and construction in order to minimize impacts to flow patterns within wetlands and discharges to Penhorn Creek. Best management practices (BMPs) would be identified and employed, in consultation with NJDEP to minimize sediment resuspension during installation of culvert extensions in Penhorn Creek, while maintaining flow within the existing culvert and during

construction of the portion of relocated channel for the Penhorn Creek tributary. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-12.19 Realignment of Water Areas

Realignment of water areas means the physical alteration or relocation of the surface configuration of any water area. This rule discourages realignment of naturally occurring water areas and conditionally accepts realignment of previously realigned water areas provided there are no adverse environmental impacts. As discussed above under Rule 7:7-12.18, Outfalls and Intakes, the Preferred Alternative would result in culvert extensions. It would also include the relocation of a portion of the Penhorn Creek tributary on the south side of the NEC. Additionally, new culverts would be constructed near Penhorn Creek, beneath the permanent access road adjacent to the viaduct, and at the outlet to the NYSW wetland mitigation site. The Preferred Alternative would maintain the long-term function and conveyance of all crossing and adjacent watercourses.

A portion of the Penhorn Creek tributary on the south side of the NEC would be relocated but would remain open, passing under the access road along the railroad embankment wall. The relocated portion of the Penhorn Creek tributary would be a trapezoidal channel with a natural bottom. The access road would be elevated on a trestle with an open grid steel grating deck for approximately 315 feet from the east bank of Penhorn Creek to the end of the railroad embankment retaining wall, above the Penhorn Creek tributary. The inoperable pump station would be demolished and removed, and the weir just south of the NEC would be removed. A new weir would be installed downstream of the twin 48-inch culvert extension to maintain surface water elevations in upstream Penhorn Creek and the wetland areas upstream of the culvert extension. Existing culverts beneath the NEC would be extended, and would have a capacity at least equal to that of the existing culvert.

The Preferred Alternative would result in temporary realignment of water areas through the installation of a cofferdam to divert water flow during the construction of culverts, culvert extensions, and the relocation of a portion of the Penhorn Creek tributary. Water removed during cofferdam dewatering would be treated with temporary sediment control measures developed by the Project Sponsor in consultation with NJDEP (e.g., sediment control basin) before being discharged back to Penhorn Creek. These features would be removed following construction of the culverts and culvert extension, and water flow would be restored to the area. Therefore, the Preferred Alternative would not result in adverse impacts to Penhorn Creek and would be consistent with this rule.

7:7-12.20 Vertical Wake or Wave Attenuation Structures

This rule outlines the circumstances under which vertical wake or wave attenuation structures are conditionally acceptable and provides design guidance for these structures. The Preferred Alternative does not involve construction of vertical wake or wave attenuation structures. Therefore, this rule is not applicable.

7:7-12.21 Submerged Cables

This rule outlines the requirements for siting submerged cables. The Preferred Alternative does not include underwater telecommunication cables therefore, this rule is not applicable.

7:7-12.22 Artificial Reefs

This rule outlines the circumstances under which artificial reefs are conditionally acceptable. The Preferred Alternative does not involve construction of artificial reefs. Therefore, this rule is not applicable.



7:7-12.23 Living Shorelines

This rule outlines the circumstances under which living shorelines are conditionally acceptable. The Preferred Alternative does not involve living shorelines. Therefore, this rule is not applicable.

7:7-12.24 Miscellaneous Uses

Miscellaneous uses are uses of water areas not specifically defined in this section or addressed in the use rules, NJAC 7:7-15. Water dependent uses of water areas not identified in the use rules are to be evaluated on a case-by-case basis to ensure that adverse impacts are minimized. Non-water dependent uses are discouraged in all water areas.

The Preferred Alternative does not involve any miscellaneous uses in water areas. Therefore, this rule is not applicable.

7:7-14.1 Rule on Location of Linear Development

This rule restricts conditions for linear development and requires it to follow the most acceptable route, to the maximum extent practicable. If part of the proposed alignment of a linear development is found to be unacceptable under the specific location rules, that alignment may nonetheless be acceptable, provided the following conditions are met: (1) There is no prudent or feasible alternative alignment that would have less impact on sensitive areas and marine fish or fisheries as defined at NJAC 7:7-16.2; (2) There will be no permanent or long-term loss of unique or irreplaceable areas; (3) Appropriate measures will be used to mitigate adverse environmental impacts to the maximum extent feasible, such as restoration of disturbed vegetation, habitats, and land and water features; and (4) The alignment is located on or in existing transportation corridors and alignments to the maximum extent practicable.

The Preferred Alternative is a linear development to be located partially on an existing transportation corridor and alignment. As discussed in Chapter 2, "Project Alternatives and Description of the Preferred Alternative," there are no reasonable alternatives that would have less impact. Because the surface alignment must connect to the existing NEC, which is located adjacent to freshwater wetlands, there is no alternative to locating certain components of the Preferred Alternative within 4.4 acres of freshwater wetlands and associated open water habitat and impacting these wetlands in New Jersey. Mitigation for direct and indirect wetland impacts would be determined by the Project Sponsor in consultation with NJDEP and USACE, and would likely include the purchase of mitigation credits from an approved mitigation bank within the same watershed as the Project site. The Preferred Alternative would maintain the long-term function and conveyance of all watercourses associated with Penhorn Creek. The surface alignment would result in temporary impacts to Penhorn Creek during construction; however, the Preferred Alternative would incorporate appropriate measures to reduce adverse environmental impacts such as erosion and sediment control measures. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-14.2 Basic Location Rule

This rule states that a location may be acceptable for development, but the NJDEP may reject or conditionally approve the proposed development of the location as reasonably necessary to: (1) Promote the public health, safety, and welfare; (2) Protect public and private property, wildlife and marine fisheries; and (3) Preserve, protect, and enhance the natural environment.

The Preferred Alternative would improve the resiliency and reliability of Amtrak and NJ TRANSIT NEC passenger rail services between Frank R. Lautenberg Station (Secaucus Junction Station) and PSNY. The Preferred Alternative would not adversely affect marine fisheries. Measures such as timing construction within wetlands to avoid sensitive periods for certain wildlife (e.g., bird breeding) would minimize impacts. In addition, the Preferred Alternative would incorporate

measures (e.g., hay bales and silt fences) to minimize indirect impacts to wetlands adjacent to the Project site. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-14.3 Secondary Impacts

Secondary impacts are the effects of additional development likely to be constructed as a result of the approval of a particular proposal. Secondary impacts can also include traffic increases, increased recreational demand and any other offsite impacts generated by on-site activities which affect the site and surrounding region. Coastal development that induces further development shall demonstrate, to the maximum extent practicable, that the secondary impacts of the development will satisfy the New Jersey CZM Rules.

As described in Chapter 2, “Project Alternatives and Description of the Preferred Alternative,” while the Project addresses maintenance and resilience of the NEC Hudson River crossing, it would not increase rail capacity, which would remain constrained at several points between Newark Penn Station and PSNY, including at PSNY. Ultimately, an increase in service between Newark Penn Station and PSNY cannot be realized until other substantial infrastructure capacity improvements are built, such as an expansion at PSNY and a replacement bridge over the Hackensack River (Portal Bridge Replacement). Therefore, Amtrak and NJ TRANSIT would operate the same number of peak-period trains using the four tracks beneath the Hudson River as in the No Action Alternative, when only two tracks would be available. The Preferred Alternative would not result in secondary impacts and would be consistent with this rule.

7:7-15.2 Housing

Housing includes single-family detached houses, multifamily units with apartments or town houses, high-rise buildings, and mixed-use developments. This rule outlines standards for housing development locations subject to coastal zone management policies. The Preferred Alternative would not involve housing development. Therefore, this rule is not applicable.

7:7-15.3 Resort/Recreational

This rule outlines the standards relevant to recreation priority and resort and recreation uses. The Preferred Alternative would not include resort/recreation uses. Therefore, this rule is not applicable.

7:7-15.4 Energy Facility

This rule outlines the standards for siting energy facilities within or near coastal areas. The Preferred Alternative does not involve siting an energy facility or any related activity. Therefore, this rule is not applicable.

7:7-15.5 Transportation

This rule establishes requirements relevant to development of public transportation projects as follows: (1) A clear need must exist, taking into account the alternatives of upgrading existing roads and of using public transportation to meet the need; (2) Provision is made for coordinated construction of public transportation rights-of-way and facilities, such as bus lanes, rail lines, and related transit stop or station facilities and parking, except where such construction would not be feasible. The purpose and need for the Project is established in this EIS (see Chapter 1, “Purpose and Need”). In October 2012, Superstorm Sandy inundated the North River Tunnel on the NEC, which is the only passenger rail connection between New Jersey and New York City, and today the tunnel remains compromised. The North River Tunnel is currently safe for use by Amtrak and NJ TRANSIT trains traveling between New Jersey and New York City and beyond. However, it is in poor condition as a result of the storm damage and has required emergency maintenance that disrupts service for hundreds of thousands of rail passengers throughout the region. Despite the



ongoing maintenance, the damage caused by the storm continues to degrade systems in the tunnel and can only be addressed through a comprehensive reconstruction of the tunnel. The Preferred Alternative would preserve the current functionality of Amtrak's NEC service and NJ TRANSIT's commuter rail service between New Jersey and PSNY by repairing the deteriorating North River Tunnel; and strengthen the NEC's resiliency to support reliable service by providing redundant capability under the Hudson River for Amtrak and NJ TRANSIT NEC trains between New Jersey and the existing PSNY; therefore, the Preferred Alternative would involve coordination of public transit services. These improvements must be achieved while maintaining uninterrupted commuter and intercity rail service and by optimizing the use of existing infrastructure.

The purpose and need for the Project is clearly demonstrated in this EIS and the Preferred Alternative would improve resiliency and reliability of Amtrak and NJ TRANSIT NEC passenger rail services between Secaucus Junction Station and PSNY. Therefore, the Preferred Alternative is consistent with this rule.

7:7-15.6 Public Facility

This rule outlines the circumstances under which a new or expanded public facility is conditionally acceptable. Public facilities include a broad range of public works for production, transfer, transmission, and recovery of water, sewerage, and other utilities. The Preferred Alternative would not involve a new or expanded public facility. Therefore, this rule is not applicable.

7:7-15.7 Industry

This rule outlines the circumstances under which industry uses are either encouraged or conditionally acceptable. The Preferred Alternative would not introduce an industry use. Therefore, this rule is not applicable.

7:7-15.8 Mining

This rule identifies the conditions under which new or expanded mining operations on land, and directly related development, for the extraction and/or processing of construction sand, gravel, ilmenite, glauconite, and other minerals are conditionally acceptable. The Preferred Alternative would not involve this type of mining operation. Therefore, this rule is not applicable.

7:7-15.9 Port

This rule is intended to encourage port uses and marine commerce. The Preferred Alternative would not involve port uses. Therefore, this rule is not applicable.

7:7-15.10 Commercial Facility

This rule outlines the circumstances under which new, expanded, or improved hotels and motels are conditionally acceptable. The Preferred Alternative would not include a new, expanded, or improved commercial facility. Therefore, this rule is not applicable.

7:7-15.11 Coastal Engineering

This rule encourages and outlines the requirements for coastal engineering measures. The Preferred Alternative would not include coastal engineering measures. Therefore, this rule is not applicable.

7:7-15.12 Dredged Material Placement on Land

This rule applies to the placement of dredged material landward of the spring high water line. The Preferred Alternative would not include dredged material placement on land. Therefore, this rule is not applicable.

7:7-15.13 National Defense Facilities Use Rule

This rule outlines the circumstances under which national defense facilities are conditionally acceptable. The Preferred Alternative would not involve national defense facilities. Therefore, this rule is not applicable.

7:7-15.14 High-Rise Structures

This rule sets the standards for high rise structures. The Preferred Alternative would not involve construction of high-rise structures. Therefore, this rule is not applicable.

7:7-16.2 Marine Fish and Fisheries

This rule discourages any activity that would adversely impact the natural functioning of marine fish, including the reproductive, spawning, and migratory patterns or species abundance or diversity of marine fish. In addition, it discourages any activity that would adversely impact any New Jersey based marine fisheries or access thereto. As discussed above under Rule 7:7-9.5, Finfish Migratory Pathways, the Hudson River portion of the Project site is a finfish migratory pathway. The Preferred Alternative would not adversely impact the natural functioning of marine fish, nor would it affect any New Jersey based marine fisheries. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.3 Water Quality

Federal, state, and local water quality requirements established under the Clean Water Act (33 U.S.C. § 1251) are the water resource standards of the coastal management program. These requirements include not only the minimum requirements imposed under the Clean Water Act but also the additional requirements adopted by states, localities, and interstate agencies pursuant to Section 510 of the Clean Water Act and such statutes as the New Jersey Water Pollution Control Act. In the waters under the jurisdiction of the Interstate Sanitation Commission in the New Jersey–New York metropolitan area, the requirements include the Interstate Sanitation Commission's Water Quality Regulations. NJDEP rules related to water pollution control are applicable throughout the entire coastal zone and include the Surface Water Quality Standards, Wastewater Discharge Requirements, Ground Water Quality Standards, and Regulations Concerning the New Jersey Pollutant Discharge Elimination System.

As described in Chapter 11, “Natural Resources,” during construction of the Preferred Alternative, the Project Sponsor’s implementation of erosion and sediment control measures in accordance with the SPPP would minimize the potential for sedimentation into surface waters, including Penhorn Creek. The plan would include measures such as the installation of silt fence, hay bales, and/or fabric filters at the construction periphery, and vegetative stabilization of soils to prevent sedimentation into surface waters. The SPPP and site-specific Soil Erosion and Sediment Control plan would be prepared in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, certified by the Hudson Essex Passaic Soil Conservation District, and would be implemented as part of the Preferred Alternative’s BMPs for construction. BMPs would also be developed in consultation with NJDEP to minimize sediment resuspension during installation of culverts and culvert extensions in Penhorn Creek, while maintaining flow within the existing culvert, the relocation of a portion of the Penhorn Creek tributary, and removal of the weir on Penhorn Creek. A new weir would be installed downstream of the twin 48-inch culvert extension to maintain surface water elevations in upstream Penhorn Creek and associated wetlands. In the eastern portion of the New Jersey surface track alignment, where the new railroad viaduct culverts would be installed near Penhorn Creek and beneath the permanent access road. These would be installed within cofferdams to minimize sediment resuspension.



The Preferred Alternative, including the rail line, associated structures, and new access road, would have the potential to accumulate pollutants on surfaces, which could then be entrained in runoff and impact water quality of receiving surface waterbodies. The Project Sponsor will implement a comprehensive stormwater management system, as required, to treat runoff from the Preferred Alternative in accordance with all local and state requirements prior to discharge to existing drainage systems. West of the Palisades tunnel portal, the Preferred Alternative would include surfaces that are vegetated or ballasted which mimic or reduce existing stormwater runoff rates and volumes. Runoff from the new surface tracks and adjacent access road would discharge directly to tidal waterbodies and in accordance with State of New Jersey requirements, management of runoff rate and volume is not required. The exception to the volume concern is approximately 700 feet of proposed rail line immediately to the west of the Palisades tunnel portal. It is anticipated that the ballasted and vegetated rail corridor over this 700-foot portion would result in less runoff than what presently discharges from the existing largely impervious conditions in that area and therefore management of runoff rate and volume would not be required. The Hoboken fan plant and ventilation shaft in New Jersey would extend well below the water table. To avoid potential destabilization of soils that could occur from lowering of the groundwater table, slurry walls extending into rock would be used for excavation support to cut off groundwater inflow at the Hoboken shaft. As an additional groundwater cutoff measure, a grouting program to fill cracks and other voids in the rock mass below and adjacent to the shaft may be required in order to minimize groundwater inflow. If the Project contractor uses a temporary spoils pit to store spoils on the west side of Tonnelle Avenue at the Tonnelle Avenue staging area, the below-grade area would likely be lined to reduce groundwater inflow into the pit and to minimize the potential for discharge to groundwater. The construction would be implemented in accordance with stormwater BMPs and in accordance with New Jersey stormwater requirements. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.4 Surface Water Use

This rule requires that coastal development demonstrate that the anticipated surface water demand of the facility will not exceed the capacity, and that construction of the facility will not cause unacceptable surface water disturbances. Neither construction nor operation of the Preferred Alternative would require the withdrawal of surface water. When construction is complete, the surface tracks component of the Preferred Alternative would mimic or reduce existing stormwater runoff rates and volumes to Penhorn Creek, since most surfaces would be vegetated or ballasted. Once in operation, the Preferred Alternative would maintain the long-term function and conveyance of all crossing and adjacent watercourses, and would not result in alteration of flow patterns. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.5 Groundwater Use

This rule requires that coastal development demonstrate, to the maximum extent practicable, that the anticipated groundwater withdrawal demand of the development, will not cause salinity intrusions into the groundwaters of the zone, degrade groundwater quality, significantly lower the water table or piezometric surface, or significantly decrease the base flow of adjacent water sources and that groundwater withdrawals not exceed the aquifer's safe yield. As discussed in Chapter 3, "Construction Methods and Activities," and Chapter 11, "Natural Resources," construction of various elements of the Preferred Alternative's surface alignment, including retained fill, retaining walls, culverts, culvert extensions, viaducts, and bridge abutment foundations, may require dewatering during construction activities. If necessary, adverse effects to nearby wells and wetlands would be eliminated by controlling seepage using sheeting or similar methods. If required by NJDEP, the extent of potential impacts from dewatering would be determined as part of a hydrogeologic investigation for a State of New Jersey construction

dewatering permit. The rate of groundwater seepage in the Palisades portion of the tunnel is expected to be very low, and would not significantly lower groundwater flow.

The Hoboken fan plant and ventilation shaft east of the Palisades would extend well below the water table. To avoid potential destabilization of soils that could occur from lowering of the groundwater table, slurry walls extending into rock would be used for excavation support to cut off groundwater inflow at the Hoboken shaft. As an additional groundwater cutoff measure, a grouting program to fill cracks and other voids in the rock mass below and adjacent to the shaft may be required in order to minimize groundwater inflow. If the Project contractor uses a temporary spoils pit to store spoils at the Tonnelle Avenue staging area, the below-grade area would be lined or otherwise managed to reduce groundwater inflow into the pit and to minimize the potential for discharge to groundwater. A moderate amount of construction dewatering and seepage control would also likely be required for the portion of the tunnel beneath the Hudson River. Seepage rates would be limited through tunnel construction methods and it is not anticipated that any adverse impacts would occur to surrounding wells, all of which are constructed in deeper rock formations, although mitigation measures would be implemented if required. Any saline groundwater recovered from sites near the Hudson River would be pumped to the Hoboken staging and fan plant site for treatment prior to discharge to a municipal sewer.

Groundwater that could seep into the Palisades portion of the tunnel would be highly alkaline, and could exceed New Jersey groundwater quality standards for volatile organic compounds and pesticides. Any groundwater seepage would be collected and discharged to sewer systems with preapproval from publicly owned treatment works.

No permanent impacts to groundwater are anticipated as a result of the Preferred Alternative. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.6 Stormwater Management

This rule requires that if a project or activity meets the definition of major development at NJAC 7:8-1.2, then the project or activity shall comply with the stormwater management rules at NJAC 7:8. As described above under Rule 7:7-16.3, Water Quality, the Project Sponsor will develop a SPPP which will include erosion and sediment control measures, minimizing the potential for discharge of sediments during construction. The Project Sponsor will prepare the plan in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, certified by the Hudson Essex Passaic Soil Conservation District. The Project Sponsor will implement the erosion and sediment control measures as part of the Preferred Alternative's BMPs for construction. For operation of the Preferred Alternative, a comprehensive stormwater management system would be developed and implemented to treat runoff prior to its discharge to existing drainage systems, in accordance with all local and State requirements. It is anticipated that these requirements would be met through track ballast filtration and recharge into the underlying subsoils. Similarly, runoff from bridge and viaduct sections would be detained and attenuated within contained ballast systems before being released to receiving waterbodies. The Project Sponsor would implement additional stormwater quality BMPs, if required. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.7 Vegetation

This rule requires that coastal development preserve, to the maximum extent practicable, existing vegetation within a development site and that new vegetation be planted with particularly appropriate coastal species native to New Jersey to the maximum extent practicable. The Project site consists primarily of railroad tracks, buildings, vacant lots, narrowly disturbed woodlands, and grassy lawns, and is largely unvegetated or dominated by ruderal species. Construction of the Preferred Alternative would result in approximately 1.7 acres of disturbance to the successional southern hardwoods ecological community, including some tree clearing, as described in Chapter



11, "Natural Resources." Additional upland successional southern hardwoods community would be cleared (approximately 0.31 acres) along the HBLR for off-street haul route Option 3 if that route is used. Implementation of erosion and sediment control measures in accordance with the SPPP would minimize potential impacts to vegetation immediately surrounding the Project site. Operation of the Preferred Alternative would require maintenance of vegetation within the right-of-way of the new track alignment. Standard Amtrak right-of-way maintenance would include measures to minimize secondary impacts to adjacent vegetation. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.8 Air Quality

This rule requires that coastal development conform to all applicable state and Federal regulations, standards, and guidelines and be consistent with the strategies of New Jersey's State Implementation Plan (SIP). NJAC 7:7-16.8 also requires that coastal development be located and designed to take full advantage of existing or planned mass transportation infrastructures and shall be managed to promote mass transportation services.

The regulations at 40 CFR § 93.150 require Federal agencies to ensure that proposed actions conform to the SIPs and do not adversely impact air quality. For actions undertaken by the FRA, the regulations related to general conformity apply. For actions undertaken by FTA, including funding, regulations related to transportation conformity apply. Since FRA is the lead Federal agency for the Preferred Alternative's environmental review under NEPA and FTA may issue funding for the Project, both general conformity and transportation conformity apply. However, the Interagency Consultation Groups (ICGs) for New Jersey and New York have reviewed the Preferred Alternative and determined that according to the transportation conformity regulations (40 CFR § 93.126), the Preferred Alternative is an exempt project and therefore does not require transportation conformity analysis.

As discussed in Chapter 13, "Air Quality," Section 13.8, as required by the general conformity regulations at 40 CFR Part 93 Subpart B, FRA and NJ TRANSIT compared the estimated emissions associated with construction of the Preferred Alternative to thresholds listed in 40 CFR § 93.153 to determine whether a conformity determination is required. The analysis demonstrated that the annual pollutant emissions associated with construction of the Preferred Alternative would be lower than the *de minimis* rates defined in the general conformity regulations. Therefore, no general conformity determination is required.

Neither construction nor operation of the Preferred Alternative would result in any exceedances of National Ambient Air Quality Standards, nor would any existing exceedances be exacerbated. Further, the purpose of the Preferred Alternative is to promote and improve mass transportation services. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.9 Public Access

This rule requires that coastal development adjacent to the waterfront provide visual and physical access to, from and along tidal waterways and their shores and to use such shores, waterfronts and waters for activities such as navigation, fishing, and recreational activities. The portion of the Preferred Alternative that is adjacent to the New Jersey waterfront is an underground tunnel and could not practically and safely provide access to the waterfront. Therefore, the Preferred Alternative does not include provisions for public access to any waterfront. Because the Preferred Alternative would not impede any existing public access to the waterfront, it would be consistent with this rule.

7:7-16.10 Scenic Resources and Design

This rule encourages new coastal development that is visually compatible with its surroundings in terms of building and site design, and enhancement of scenic resources and discourages new coastal development that is not visually compatible with existing scenic resources. The Preferred Alternative is consistent with its surroundings and context. As described in Chapter 10, “Visual and Aesthetic Resources,” the Project Sponsor, in cooperation with the other Project Partners, will design the Hoboken fan plant to be visually compatible with the character of the surrounding area. The Project Sponsor, in cooperation with the other Project Partners, will coordinate with the local community and seek input in determining the appropriate design for the visible portions of the fan plant. The scale and form of the Hoboken fan plant would be consistent with the visual character of other light industrial buildings nearby, including low-rise industrial buildings along Willow Avenue to the north and the wastewater treatment plant immediately to the south beyond the Hudson-Bergen Light Rail right-of-way. The impact is expected to be neutral in consideration of the current condition of the lot, which is vacant and contains remnants of the previous structures that were demolished. Therefore, the Preferred Alternative is consistent with this rule.

7:7-16.11 Buffers and Compatibility of Uses

This rule requires that development be compatible with adjacent land uses to the maximum extent practicable. The Preferred Alternative include the construction of a surface rail alignment adjacent to the existing NEC rail alignment, which is compatible with surrounding uses. As discussed in Chapter 6A, “Land Use, Zoning, and Public Policy,” the proposed Hoboken fan plant would be consistent with the existing industrial zoning of its site and with other light industrial buildings nearby. The Project Sponsor, in cooperation with the other Project Partners, will coordinate with the local residential community nearby regarding the appearance of the new fan plant so that it is visually compatible with the residential area. Overall, the fan plant would not conflict with nearby land uses and would not result in changes to land use patterns in the surrounding area. Therefore, the Preferred Alternative would be consistent with this rule.

7:7-16.12 Traffic

This rule requires that coastal development be designed, located, and operated in a manner to cause the least possible disturbance to traffic systems and requires that alternative means of transportation, that is, public and private mass transportation facilities and services, be considered and, where feasible, incorporated into the design and management of a proposed development to reduce the number of individual vehicle trips generated as a result of the facility.

As described in Chapter 5A, “Traffic and Pedestrians,” construction activities for the Preferred Alternative would result in adverse impacts to traffic flow at intersections near the construction staging areas in North Bergen and Hoboken. For all construction locations, the Project Sponsor will develop Maintenance and Protection of Traffic (MPT) plans in coordination with local transportation authorities to maintain travel lanes, and detour through traffic away from construction activities and equipment to the extent practicable.

Upon completion of construction, operation of the Preferred Alternative would not result in any adverse effects to traffic systems.

The Project Partners have developed conceptual staging and sequencing concepts for the construction staging areas in New Jersey with the goal of minimizing adverse traffic impacts at local intersections. This has included consultation with locally affected municipalities. Additionally, the Preferred Alternative would preserve the current functionality of the NEC Hudson River rail crossing between New Jersey and New York and strengthen the resilience of the NEC, thereby satisfying the requirement to incorporate mass transportation facilities and services. Therefore, the Preferred Alternative would be consistent with this rule.



7:7-16.13 Subsurface Sewage Disposal Systems

This rule outlines the acceptable conditions for subsurface sewage disposal systems. The Preferred Alternative does not include a subsurface sewage disposal system. Therefore, this rule is not applicable.

7:7-16.14 Solid and Hazardous Waste

This rule requires that coastal development conform with all applicable state and Federal regulations, standards, and guidelines for the handling and disposal of solid and hazardous wastes. Proposed construction in New Jersey would be completed in accordance with the NJDEP Linear Construction Technical Guidance, dated January 2012 (latest version prevails). Construction would be completed as a Linear Construction Project (LCP) under the oversight of an assigned Licensed Site Remediation Professional (LSRP). The LSRP would prepare an SMMP and would oversee the reuse or disposal of all Project-related contaminated materials. Additionally, a Soil Erosion and Sediment Control Plan would be submitted to the Hudson Essex Passaic Soil Conservation District for proposed construction activities and appropriate approvals and permits would be obtained from the NJSEA. Coordination with NJDEP and other agencies would be required prior to any work disturbing the existing engineering controls at these sites. Following construction, engineering controls would be restored.

As discussed in Chapter 16, “Contaminated Materials,” because there is the potential to encounter serpentinite minerals that contain naturally occurring asbestos (NOA) during construction of the Preferred Alternative, especially during excavation and tunneling operations, the Project Sponsor will implement measures to mitigate exposure to NOA as part of the SMMP, consistent with OSHA asbestos standards. Approaches for reducing NOA exposure are similar to practices used for ACM in commercial applications. Typical engineering controls involve the use of covers and caps, vegetation, fencing, landscaping, and in some conditions, the application of water to suppress dust. Common work practices include limiting activities on NOA-containing areas, reducing driving speed on unpaved roads that may contain NOA, and cleaning vehicles driven over NOA. Worker health and safety measures that include respiratory protection may also be warranted.

The Project Sponsor would develop protocols during final design to identify excavated rock and soil (referred to as “spoils”) that may contain contaminated materials, so that they can be handled appropriately and disposed of at a suitable location. Most of the excavated material would be clean, crushed rock, which can be reused beneficially at other locations. The rock is not likely to be contaminated because of both its depth and impermeability—although there is a possibility that some of the excavated rock could contain NOA materials, which would limit the use of that portion of the spoils. The inhalation of asbestos fibers can cause fibrotic lung disease (i.e., asbestosis) and changes in the lining of the chest cavity (pleura). Therefore, excavated material would be tested prior to any beneficial reuse or off-site disposal, which would be conducted in accordance with Federal, state, and local regulations. Asbestos wastes must go to landfills certified to receive such wastes. The Project Sponsor will develop protocols for the transport of spoils from the construction sites to ensure the safe handling of these materials and would include procedures to secure the material from spilling off trucks, as well as for any inadvertent or accidental spills of materials falling from trucks removing this material from the staging sites. For spoils that cannot be reused, commercial disposal sites may be appropriate. These facilities are required to meet all applicable regulations and typically process soils and dredge materials to recycle or beneficially reuse them. All protocols related to spoils handling and disposal would conform with all applicable state and Federal regulations, standards and guidelines for the handling and disposal of solid and hazardous wastes. Therefore, the Preferred Alternative would be consistent with this rule.

21.4 NEW YORK COASTAL ZONE CONSISTENCY ASSESSMENT

21.4.1 OVERVIEW

New York City's LWRP consists 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.

In 2011, revisions to the New York City's LWRP were made to reflect policy elements included in the NYCDCP'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 restoration of ecologically significant areas; and design of best practices for waterfront open spaces. These revisions to the LWRP were approved by the New York City Council on October 30, 2013 and approved by the New York State Secretary of State on February 3, 2016.

21.4.2 NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM POLICIES

An assessment of the Preferred Alternative's consistency with the revised New York City LWRP's applicable policies is provided below, organized by LWRP policy, based on the revised 2016 Coastal Assessment Form included with this assessment in **Appendix 21**. NYSDOS issued concurrence on January 2, 2019 that the Preferred Alternative is consistent with the New York Coastal Management Program. Where the language in this EIS refers to actions that will be taken by the Project Sponsor, it will be the lead Federal agency's responsibility to ensure the Project Sponsor carries out the specified activities as they will be described in the ROD.

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

3.5 In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses

The Project site is adjacent to a number of Priority Marine Activity Zones along the western shore of Manhattan, which is an area of heavy vessel traffic and is equipped with bulkheads, docks, piers, and fendering⁵ to support water-dependent uses. The Preferred Alternative would involve hardening a small area of the river bottom, totaling approximately 3 acres, through deep soil mixing. This work would be conducted in multiple phases to limit the disruption to marine traffic. The in-water construction zone would affect an area that is a total of 1,200 feet long and 110 feet wide, located approximately 600 feet from the New York bulkhead (70 feet past the pierhead line). Each phase of construction would have a duration of approximately 13 months, for a total construction duration of up to 26 months, depending on how the construction is staged. The soil improvement area is not directly within a Priority Marine Activity Zone, and the temporary loss of this portion of the river to vessel traffic during construction would not hinder vessel activity in Priority Marine Activity Zones in the area. Therefore, the Preferred Alternative would promote this policy.

⁵ Element designed to take the initial impact from a vessel, similar to a bumper.



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

4.3 *Protect designated Significant Coastal Fish and Wildlife Habitats.*

The Preferred Alternative would result in the modification of 3 acres of bottom habitat within the Lower Hudson Reach of the Hudson River where soil improvement through deep soil mixing would occur. Approximately 2.3 acres would be altered from soft bottom to hard bottom with soilcrete at the elevation of the mudline (the riverbed), and 0.7 acres of soilcrete would be elevated 1 to 2 feet above the mudline and also altered from soft bottom to hard bottom. As discussed in Chapter 11, "Natural Resources," this portion of the river is a designated Significant Coastal Fish and Wildlife Habitat (SCFWH), largely based on its importance in providing wintering habitat for young-of-the-year and yearling-or-older striped bass. The Lower Hudson Reach SCFWH also supports a diverse and historically highly productive ecosystem of fish and invertebrates, and is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine, and marine fish species, and a migratory and feeding area for birds. Since striped bass spawning and larval habitat occur in freshwater regions well upriver of the soil improvement area, and striped bass juveniles and adults are widely distributed throughout the estuary, these life stages would not be adversely impacted by the Preferred Alternative. Based on consultation with NMFS, the Project Sponsor would carry out in-water work and cofferdam construction only between July 1 and January 20, to minimize potential impacts to migrating anadromous species including alewife, blueback herring, and striped bass.

In-water construction activities in the 3-acre soil improvement area would have the potential to result in temporary increases in suspended sediment that would be localized and expected to dissipate quickly and would not result in adverse impacts to aquatic biota. Turbidity curtains deployed during removal of the cofferdams would further minimize the effects of sediment resuspension. Cofferdams would also not be removed until the improved soil is hardened.

Installation of the sheet piles and king piles for the cofferdam structures would result in temporary increased in underwater noise levels that would not be expected to exceed the threshold for physiological injury to fishes. Fish would likely avoid portions of the river in proximity to the cofferdam while the sheet piles and king piles are driven; passage through waters without elevated noise levels due to sheet pile driving or removal would be available both in the river channel to the west and in the shallower waters to the east of the low-cover area. Additionally, during the in-water work period (July 1 through January 20), the majority of the work would be conducted within the cofferdam and would not result in significant increases of underwater noise.

The temporary loss of foraging habitat within and in the vicinity of the soil improvement area, when compared to the available suitable habitat that would still be available within the lower Hudson River, would not result in adverse impacts to striped bass or other aquatic biota. Encrusting organisms would be expected to colonize the soil improvement area, and fish would be expected to return to the area following construction. The Preferred Alternative would not destroy or degrade habitat values, nor significantly impair the viability of the habitat for aquatic organisms associated with the SCFWH. The Project Sponsor will monitor the recovery of the 0.7 acres where the soilcrete would extend above the existing mudline for five years to assess recovery as fish foraging habitat. The Project Sponsor will also monitor the recovery of the remaining 2.3 acres of soilcrete post-construction. Monitoring of the soilcrete will be conducted in consultation with USACE, NMFS, and NYSDEC. Coordination with NYSDEC is ongoing with respect to requirements for additional mitigation for the modification to 3 acres of bottom habitat within the Hudson River.

NYSDEC recommendations include contribution to the Estuarium⁶ at Pier 26 within Hudson River Park or purchase of credits from the Saw Mill Creek Wetland Mitigation Bank on Staten Island.

With implementation of measures recommended through these consultations, the permanent operation of the Preferred Alternative would not adversely affect the designation of this portion of the Hudson River as SCFWH. Therefore, the Preferred Alternative would promote this 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.*

Shortnose and Atlantic sturgeon adults and sub-adults have the potential to occur within the 3-acre area of the lower Hudson River that would receive soil improvement under the Preferred Alternative, as discussed in Chapter 11, "Natural Resources." Sturgeon use the lower Hudson River primarily for migration rather than extended occupation for feeding or reproduction. As such, they are more likely to occur in the deeper waters of the river along the margins of the deep navigation channel than in shallower waters. Since any impacts to water or sediment quality associated with the Preferred Alternative's in-water soil improvement construction activities would be localized and temporary, the deep channel habitat is unlikely to be adversely impacted during construction. Sturgeon feed on the river bottom (i.e., they are benthic feeders). Additionally, cofferdams would not be removed until the improved soil has hardened.

Behavioral effects, such as avoidance or disruption of foraging activities, may occur in sturgeon exposed to noise above the level resulting in behavioral effects when closer than 230 feet from the pile being driven. Any sturgeon that gets closer than 230 feet from the pile being driven would be expected to detect the elevated noise levels and move away. Because of the wide width of the Hudson River where the cofferdams would be installed and removed, this avoidance behavior is unlikely to affect sturgeon foraging or migration to upriver spawning grounds.

Additionally prior to conducting the deep soil mixing within the cofferdam, the Project Sponsor would check the area surrounded by the cofferdam for sturgeon. Should sturgeon become entrapped within the cofferdam area, work will cease and NOAA Fisheries will be notified.

The 2.3-acre portion of the low-cover area in which the soilcrete would not extend above the mudline would initially be unsuitable for burrowing organisms because of its relatively hard surface, but over time natural river currents would deposit sediments on top of the soil and grout mixture. These sediments could provide habitat for soft-bottom organisms that would provide forage for sturgeon. The 0.7-acre portion of the soilcrete that would extend between 1 and 2 feet above the mudline is not likely to be suitable foraging habitat for Atlantic sturgeon or shortnose sturgeon. This area is outside the 45-foot-deep Federal navigation channel but within an area of the river that is approximately 50 feet deep. Juvenile and adult Atlantic sturgeon in this part of the Hudson River typically occur in deeper waters and may occur in this area as transients, in the case of migrating adults, or for foraging, in the case of juveniles and subadults. Despite the conversion of soft-bottom habitat to hard-bottom habitat, the loss of this area as foraging habitat for Atlantic sturgeon is small relative to the unaffected soft-bottom habitat in the lower Hudson River. Therefore, the loss of this area as foraging habitat for Atlantic sturgeon may affect but is unlikely to adversely affect this species.

Shortnose sturgeon do have the potential to use the 0.7-acre portion of the Hudson River affected by the elevated soilcrete as foraging habitat. However, considering the extent of suitable foraging habitat in the lower Hudson River that would be unaffected by the Preferred Alternative, the loss

⁶ <https://www.clarkson.edu/news/hudson-river-park-trust-names-clarkson-university-consortium-partners-new-state-art>.



of this 0.7-acre area of foraging habitat for shortnose sturgeon in the lower Hudson River is not likely to adversely affect this species. The slight increase in the elevation of the river bottom in this location would not cause any obstruction of passage for either species of sturgeon. FRA received concurrence from NMFS under Section 7 of the Endangered Species Act that the Preferred Alternative is not likely to adversely affect ESA-listed species under NMFS jurisdiction (see **Appendix 11**).

The Project Sponsor will monitor the recovery of the 3 acres of soilcrete for five years to assess the recovery as foraging habitat for EFH species, and other fish species. Monitoring of this area will be conducted in consultation with USACE, NMFS, and NYSDEC. In addition to the monitoring, the Project Sponsor is continuing coordination with NYSDEC regarding additional mitigation for the modification to 3 acres of bottom habitat within the Hudson River. NYSDEC recommendations include contribution to the Estuarium⁷ at Pier 26 within Hudson River Park or purchase of credits from the Saw Mill Creek Wetland Mitigation Bank on Staten Island.

Therefore, on the basis of this information, the Preferred Alternative would promote this policy.

4.8 *Maintain and protect living aquatic resources.*

In-water construction activities would have the potential to result in temporary adverse impacts to aquatic resources in a localized area surrounding the 3-acre soil improvement area due to temporary increases in suspended sediment and underwater noise, as discussed in Chapter 11, "Natural Resources." Installation of steel sheet pile and steel pipe king piles generally does not result in significant levels of sediment disturbance. Sediment resuspension associated with removal of the cofferdams would result in minor, short-term increases in suspended sediment. The use of turbidity curtains during removal of the cofferdams would minimize the effects of sediment resuspension. Deep soil mixing within the soil improvement area would be contained within the cofferdams and would not result in additional suspended sediment. Additionally, the Project Sponsor would not remove cofferdams until the improved soil has hardened. The average tidal current in the Hudson River is 1.4 knots. Therefore, any sediment resuspended during in-water construction would move away from the area, either a short distance upstream or downstream depending on tidal direction, dissipate quickly, and not result in adverse long-term impacts to water quality and aquatic resources. Similarly, any contaminants released to the water column as a result of sediment disturbance would dissipate quickly and would not result in adverse long-term impacts to water or sediment quality. Any sediment resuspension that could occur would be well below physiological impact thresholds of larval and adult fish and benthic macroinvertebrates adapted to estuarine environments.

The Preferred Alternative would require up to four barges moored-in-place, along with two smaller vessels, one for personnel and one for materials. The potential for Project vessel interaction with finfish is extremely minimal, as barges would be moored-in-place (i.e., stationary) in relatively deep water during in-water work, and only two small vessels would be used periodically to transport personnel and materials to the site. This minor increase in vessel activity would result in an incremental increase in underwater noise levels in the vicinity of the 3-acre soil improvement area, which could lead to habitat avoidance. However, the slight increase would be well within the typical range of vessel activity in the lower Hudson River, which is an area of heavy commercial vessel traffic. As such, aquatic organisms are likely acclimated to ambient noise levels and would not be adversely affected by the slight, possibly undetectable, increase in vessel noise.

Installation of the king piles and steel sheet pile cofferdam walls with a vibratory hammer would result in a temporary increase in underwater noise during installation of each cofferdam section.

⁷ <https://www.clarkson.edu/news/hudson-river-park-trust-names-clarkson-university-consortium-partners-new-state-art>.

Elevated underwater noise would be temporary and intermittent. As described above under Policy 4.7, behavioral effects, such as avoidance or disruption of foraging activities, may occur in sturgeon (and other fish species) when closer than 230 feet from the pile being driven. Any sturgeon or other fish that gets closer than 230 feet from the pile being driven would be expected to detect the elevated noise levels and move away. Because of the wide width of the Hudson River where the cofferdams would be installed and removed, this avoidance behavior is unlikely to affect fish spawning, foraging or migration.

The 3-acre soil improvement area, where fine-grained silt/clay sediment would be mixed with cement grout to form soilcrete, would no longer provide suitable habitat for infaunal macroinvertebrates⁸ and subsequently would not provide forage habitat for species that prey on them. Approximately 2.3 acres of the soilcrete would be approximately level with the surrounding riverbed, and over time, sediments would be deposited over the soilcrete at sedimentation rates typical of the lower Hudson River, possibly providing some soft-bottom habitat for benthic invertebrates. Therefore, within this portion of the low-cover area, modification of the river bottom to achieve the soil improvement necessary to protect the Preferred Alternative would not result in adverse impacts to aquatic biota. Approximately 0.7 acres of soilcrete would be elevated 1 to 2 feet above the mudline. This elevated portion of the soilcrete would also provide habitat for encrusting organisms, which would provide some foraging habitat for fish. It would have a lower potential to accumulate sediment that would provide soft-bottom habitat for benthic invertebrates and would not, therefore, provide forage habitat to soft-bottom-feeding fish species. The Project Sponsor will monitor the recovery of the 0.7 acres of elevated soilcrete and the 2.3 acres approximately level with the surrounding riverbed for five years to assess the recovery as fish foraging habitat. Monitoring of the 3-acre soilcrete area will be conducted in consultation with USACE, NMFS, and NYSDEC. In addition to the monitoring, coordination with NYSDEC is ongoing regarding additional mitigation for the modification of bottom habitat within the Hudson River. NYSDEC recommendations include contribution to the Estuarium⁹ at Pier 26 within Hudson River Park or purchase of credits from the Saw Mill Creek Wetland Mitigation Bank on Staten Island. Therefore, the Preferred Alternative would promote this policy.

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

5.1 Manage direct or indirect discharges to waterbodies.

The Project Sponsor will require that any groundwater recovered during dewatering be treated and discharged to the municipal sewer in accordance with NYCDEP requirements. As described in Chapter 3, "Construction Methods and Construction Activities," Section 3.3.6.1, ground improvement activities for the Hudson River bulkhead would affect operations at the adjacent West 30th Street Heliport and would require the relocation of helicopter fueling facilities, if the heliport has not already relocated prior to the construction for the Hudson Tunnel Project. If the Hudson Tunnel Project must relocate the fueling facilities, the heliport's above-ground fuel tank would be moved either to a new permanent location, if that location can be identified (possibly near West 30th Street), or to a temporary new location. The temporary location might be within the heliport property or potentially on a new fueling barge that would be moored at the heliport. In either case, the fueling facility would comply with all applicable regulatory restrictions related to siting such a facility. If a temporary fuel barge is used, it would be moored for approximately 18 months on the New York side of the Hudson River near the West 30th Street Heliport during construction near the shoreline. The fuel barge would be 30 to 40 feet long and would hold 8,000 gallons of fuel.

⁸ Animals without backbones (non-microscopic) that burrow into and live in the bottom deposits of an ocean, river, or lake.

⁹ <https://www.clarkson.edu/news/hudson-river-park-trust-names-clarkson-university-consortium-partners-new-state-art>.



The barge would be equipped with spill containment measures and would be moored in accordance with a United States Coast Guard-approved mooring plan. With these measures in place, the temporary fuel barge would not have the potential to adversely affect water quality. When the Project is complete, the Project's drainage system would discharge water removed in the tunnel from the Twelfth Avenue shaft to the city combined sewer downstream of the regulator, requiring a NYSDEC SPDES permit. The Project Sponsor will treat the recovered water in accordance with permit requirements prior to being conveyed to the Hudson River. Therefore, the Preferred Alternative would promote this policy.

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

See the response to Policy 5.1; the Preferred Alternative would promote this policy.

5.3 *Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.*

Soil improvement through deep soil mixing within the 3-acre portion of the lower Hudson River would be conducted within cofferdams, minimizing potential increases in suspended sediment and adverse impacts to water quality due to the Preferred Alternative, as described in Chapter 11, "Natural Resources." Excess grout material and native soil that tend to accumulate during deep soil mixing would be removed for off-site transport and would not affect water quality once the cofferdams are removed. The introduced soilcrete in the low-cover area would be composed of a mixture of cement and native soil and would not result in leaching of contaminants into the water column. Therefore, the Preferred Alternative would promote 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.

6.1 *Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.*

The areas of concern for flooding associated with the Preferred Alternative in Manhattan would be the proposed and existing tunnel portals, which emerge below grade at Tenth Avenue between West 31st and 33rd Streets; the Tenth Avenue fan plant beneath the building located at 450 West 33rd Street; and the proposed fan plant on the block between West 29th and West 30th Streets east of Twelfth Avenue. Since the Preferred Alternative would not introduce any substantial changes in a coastal area such that it could affect wave impacts or otherwise affect flooding of other areas and uses, potential flooding at portals and ventilation structures is the central and most critical issue. The Preferred Alternative would be designed to be resistant to future severe storms, using a DFE that is 5 feet higher than FEMA's current BFE (100-year flood elevation). All entrances and openings would be raised above the DFE or any entrances below the DFE would be watertight. The shaft would include hardening to protect against water incursion and any equipment within the shaft and fan plant would be above the DFE or flood-resistant. Moreover, when Project elements can be designed without substantial financial implications to a more conservative standard, they will be. The Tenth Avenue fan plant would be located below both the BFE and DFE within the below-grade rail complex leading to Penn Station New York (PSNY). In this area, the Metropolitan Transportation Authority (MTA) Long Island Rail Road (LIRR) is currently planning a flood protection project that will include perimeter protection and drainage improvements around the LIRR John D. Caemmerer West Side Yard, which will provide protection from storm events. A new permanent wall will be installed, with additional deployable barriers to be implemented across access points in advance of storm and flood events. This perimeter wall will provide flood protection up to a level that is 1 foot lower than the Project's DFE and will protect

the below-grade rail infrastructure west of PSNY, including the Tenth Avenue fan plant. Therefore, potential losses due to flooding have been minimized to the extent possible and the Preferred Alternative would promote this policy.

6.2 *Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms) into the planning and design of projects in the city's Coastal Zone.*

Guidance provided by NYCDPCP¹⁰ recommends a detailed methodology to determine a project's consistency with Policy 6.2. A summary of this process is included below.

1. *Identify vulnerabilities and consequences: assess the project's vulnerabilities to future coastal hazards and identify what the potential consequences may be.*

(a) *Complete the Flood Elevation Worksheet.*

The information in the following subsections is based on the results of the Flood Elevation Worksheet completed for this Coastal Management Program assessment provided as Attachment 1 to the Coastal Assessment Form provided in **Appendix 21**. Based on the range of sea level rise predictions, Mean Higher High Water (MHHW) in the study area (currently +2.61 feet) could range from +3.28 to +5.11 feet NAVD88 by the 2050s, and from +3.86 to +8.86 feet by the end of the century. As described in Chapter 14, "Greenhouse Gas Emissions and Resilience," Section 14.3.3.4, the 100-year flood elevations could range from up to approximately +17 feet NAVD88 by the 2080s and up to approximately +18 feet NAVD88 by 2100 at the Twelfth Avenue ventilation shaft and fan plant, and up to approximately +16 feet NAVD88 by the 2080s and up to approximately +17 feet NAVD88 by 2100 at the portal sites.

(b) *Identify any project features that may be located below the elevation of the 1% floodplain over the lifespan of the project under any sea level rise scenario.*

For the Preferred Alternative, structures and buildings will be designed for continued operation over a minimum period of 50 years before complete refurbishment and renovations are necessary due to normal wear and tear and obsolescence, and the design life of the ventilation structures, tunnels, retaining walls, and marine structures will be 100 years. The New York City Panel on Climate Change (NPCC) projected that sea levels are likely to increase by up to 30 inches by the 2050s and up to 75 inches by the end of the century (highest projections). Based on FEMA Preliminary Flood Insurance Rate Maps, the current BFE for the proposed Twelfth Avenue ventilation shaft and fan plant is 12 feet NAVD88; the current BFE for the new and existing tunnel portals at Tenth Avenue and the Tenth Avenue fan plant beneath the building located at 450 West 33rd Street is 11 feet (see Figure 11-7 in Chapter 11, "Natural Resources"). The fan plants would provide regular and emergency ventilation to the tunnel and would contain communications and systems rooms, signal equipment, controls for the ventilation system, and connecting conduits. The portals are the openings to the below-grade sections of the existing and new tunnels.

(c) *Identify any vulnerable, critical, or potentially hazardous features that may be located below the elevation of Mean Higher High Water (MHHW) over the lifespan of the project under any sea level rise scenario.*

Based on the range of sea level rise predictions, MHHW in the Project site (currently +2.61 feet) could range from +3.28 to +5.11 feet NAVD88 by the 2050s, and from +3.86 to +8.86 feet by the end of the century. None of the surface features of the Twelfth Avenue fan plant or the Tenth

¹⁰ NYCDPCP. *The New York City Waterfront Revitalization Program: Climate Change Adaptation Guidance*. November 2018.



Avenue portal for the new Hudson River Tunnel and the North River Tunnel would include vulnerable, critical, or potentially hazardous features below MHHW under any sea level rise projection through the end of the century. The Tenth Avenue fan plant, including communications and systems rooms, signal equipment, controls for the ventilation system, and connecting conduits, would be located below projected MHHW within the subsurface railroad complex beneath the building located at 450 West 33rd Street. However, the planned perimeter wall and other measures described above under Policy 6.1 would provide flood protection up to a level that is 1 foot lower than the Project's DFE and would protect the below-grade rail infrastructure west of PSNY, including the Tenth Avenue fan plant.

(d) Describe how any additional coastal hazards are likely to affect the project, both currently and in the future, such as waves, high winds, or debris.

The surface features of the Project are located within the 100-year floodplain in Zone AE, which represents the area with a 1 percent chance of flooding each year. The Twelfth Avenue fan plant, Tenth Avenue fan plant, and Tenth Avenue portals are inland and are not located on the shoreline. Wave action hazards (i.e., Zone VE) have not been designated for the Project site. Therefore, storm impacts due to waves, high winds, or debris would not be expected to affect these Project features.

2. Identify adaptive strategies: assess how the vulnerabilities and consequences identified in Step 1 are addressed through the project's design and planning.

(a) For any features identified in Step 1(b), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection? Describe how any planned adaptive measures would protect the feature in the future from flooding.

The Preferred Alternative would be designed to be resistant to future severe storms, using a DFE that is 5 feet higher than FEMA's current BFE. The new and existing Manhattan portal at Tenth Avenue and the fan plant beneath the building located at 450 West 33rd Street would be protected from flooding during storm events by a new perimeter wall that LIRR is planning to construct around the West Side Yard, which would also enclose the area where the portals are and will be located. The perimeter wall will have a DFE of 4 feet above the BFE, which is 1 foot below the Project's DFE, and will include drainage improvements, a new permanent wall, and additional deployable barriers to be implemented across driveways and access points in advance of storm events. The Hudson River Tunnel tubes, which would be entirely below ground, would include floodgates within the tunnel on both sides of the river to protect the tunnel and landside areas from future flooding. Floodgates on the New York side of the river would be located in the tunnel at the Twelfth Avenue ventilation shaft and at the new tunnel's eastern portal beneath the building located at 450 West 33rd Street, just east of Tenth Avenue (see Figure 2-6 in Chapter 2, "Project Alternatives and Description of the Preferred Alternative"). The Hoboken and Twelfth Avenue ventilation shafts and associated fan plants for the new Hudson River Tunnel would be located within the 100-year floodplain and below the Project's DFE. Therefore, all entrances and openings would be raised above the DFE or any entrances below the DFE would be watertight. The shafts would include hardening to protect against water incursion, and any equipment within the shafts or fan plants would be either flood-resistant or located above the DFE within the structure.

(b) For any features identified in Step 1(c), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection? Describe how any planned adaptive measures would protect the feature in the future from flooding.

As described above in Step 1(c), MHHW under sea level rise projections would not affect the Project.

(c) Describe how the project would affect the flood protection of adjacent sites, if relevant.

As described above in Step 1(d), the Project is not within a wave impact zone in New York City's designated flood hazard area. Therefore, no specific measures are required.

3. Assess policy consistency: conclude whether the project is consistent with Policy 6.2 of the Waterfront Revitalization Plan.

The Preferred Alternative includes features (i.e., tunnel portals and fan plants) that would be located within the 100-year floodplain. The remainder of the Preferred Alternative in New York would be underground. The site of the fan plants and portal are inland sites that do not have the potential to be affected by additional coastal hazards such as waves, high winds, or debris. The fan plants and portal would be within the 100-year floodplain under all of the sea level rise scenarios. For this reason, the Preferred Alternative has been designed with a DFE that is 5 feet above the current BFE, and resiliency measures (described above under 2a) have been incorporated wherever possible to protect against future flooding. Therefore, the Preferred Alternative would promote this policy.

Policy 7: Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.

7.1 *Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.*

Contaminated soil and groundwater resulting from these uses is likely to be encountered at various locations during construction. The Project Sponsor will conduct Phase II Subsurface Investigations that will include soil and groundwater sampling activities, as well as hazardous materials building investigations, at certain locations along the Project site where existing information is insufficient and/or where the potential for contamination exists based on available data, and where Project construction could encounter the contamination. These activities will determine the presence or absence of contaminants. Based on the findings of these initial investigations, additional investigations may be undertaken to further determine the extent and levels of contamination at the affected properties. The beneficial reuse or off-site disposal of excavated materials from construction of the Preferred Alternative would be conducted in accordance with Federal, state, and local regulations.

The limited sediment resuspension due to cofferdam installation and removal would not result in adverse impacts to sediment quality of the lower Hudson River. As described under Policy 4, sediment resuspension would be minimal and temporary, and would dissipate quickly with the tidal currents. Similarly, any contaminants released to the water column¹¹ as a result of sediment disturbance would dissipate quickly and would not result in adverse long-term impacts to water or sediment quality. The use of turbidity curtains during cofferdam removal, and removing cofferdams only after the improved soil has hardened, would further minimize the effects of sediment resuspension. In the Hudson River, excess grout material and native soil that tend to accumulate during deep soil mixing would be removed for off-site transport and would not lead to degradation once the cofferdams were removed. Therefore, the Preferred Alternative would promote this policy.

¹¹ A water column is the volume of water extending from the surface to the bottom.



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

8.1 *Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.*

As discussed in Chapter 8, "Open Space and Recreational Resources," the Preferred Alternative would be located under both the High Line, a 1.45-mile-long linear park being developed on the structure of a former elevated freight rail line, and Hudson River Park, a 550-acre linear waterfront park along New York City's Hudson River waterfront. The Preferred Alternative would pass beneath the High Line in a below-ground concrete tunnel casing that Amtrak is constructing as part of a separate project, the Hudson Yards Right-of-Way Preservation Project beneath the West Side Yard.

The boundaries of Hudson River Park extend from the western boundary of Twelfth Avenue, near the Project site, offshore to the pierhead line in the Hudson River. The tunnel alignment beneath Hudson River Park would be constructed via mined excavation, to minimize the potential for construction disruption that would otherwise be associated with cut-and-cover excavation of the tunnel segment through the park. To facilitate the mining, soil in this area would first be hardened through ground freezing or a combination of Sequential Excavation Method (SEM) mining, a type of below ground excavation, in combination with ground freezing. The ground improvement in this area would also include some cement grouting at the bulkhead and other locations. The construction work to improve soils in Hudson River Park would be staged from the southern part of the West 30th Street Heliport, and that part of the heliport would be closed for approximately 18 months as a result. If SEM tunneling is used, a temporary construction shaft will be excavated in the West 30th Street Heliport construction staging area, requiring a larger area of the heliport.

Construction activities at Hudson River Park would be conducted in coordination with the Hudson River Park Trust (HRPT) to minimize adverse effects on the park to the extent practicable. With either construction approach, a small area of the recreational portion of the park would be affected and approximately 200 feet of the park walkway, as well as the Route 9A bikeway, may need to be narrowed, although both would remain open. The Project Partners are coordinating, and will continue to coordinate, with HRPT regarding measures to minimize adverse effects during the 18 months of construction activities in the park.

During the full approximately 1.5-year construction period in Hudson River Park, equipment would be located within the West 30th Street Heliport. This construction equipment would be visible to people in nearby areas of Hudson River Park. Construction barricades would be installed to block views of the construction zone for park users.

In-water ground improvement within the Hudson River would be outside the pierhead line and therefore, outside the boundaries of Hudson River Park. Nonetheless, these activities would occur close to Hudson River Park's water area, which extends to the pierhead line. This could be inconvenient for boaters using the boathouse and sailboat moorings in the park at and near Pier 66 (at 26th Street), but would not limit boaters' access to and from the channel. The Project Sponsor will implement measures to ensure that there will be no conflicts with boat traffic during construction, including lighting and AIS transponders, there would be no adverse impacts on maritime operations during construction of the Preferred Alternative. These measures would also protect recreational boaters, including sailboats, kayaks, and canoes that operate from the boathouse at Pier 66 at West 26th Street in New York, in Hudson River Park. This area would be reopened to recreational boating activities, which may originate in Hudson River Park, upon the completion of construction.

The Preferred Alternative would have no permanent adverse effects on public access to either the High Line or Hudson River Park. Therefore, the Preferred Alternative would promote this policy.

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

The Preferred Alternative is a passenger rail tunnel, and thus, does not include suitable locations for the development of waterfront open space and recreation. As discussed above in Policy 8.1, a small portion of the walkway in Hudson River Park and the adjacent Route 9A bikeway would be temporarily reduced during installation and removal of the ground freezing equipment. However, the Preferred Alternative would otherwise continue to allow public access to existing waterfront open space. Therefore, the Preferred Alternative would promote 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.

10.1 *Retain and reserve historic resources, and enhance resources significant to the coastal culture of New York City.*

As discussed in Chapter 9, “Historic and Archaeological Resources,” FRA has completed consultation in accordance with Section 106 of the National Historic Preservation Act. Section 106 regulations require that FRA identify historic properties listed in or eligible for listing in the National Register of Historic Places within the Project’s Area of Potential Effects (APE); assess effects to historic properties; avoid, minimize, or mitigate any adverse effects; and consult with the relevant State Historic Preservation Officer (SHPO), which for the Hudson Tunnel Project are the New Jersey Historic Preservation Office (NJHPO) and New York State Historic Preservation Office (NYSHPO). For the portion of the APE in New York, FRA determined through the Section 106 process, with NYSHPO concurrence, that the Preferred Alternative would have adverse effects on the North River Tunnel; the New York Improvements and Tunnel Extension of the Pennsylvania Railroad; and the Hudson River Bulkhead. The Preferred Alternative also has the potential for adverse effect as a result of accidental construction damage on two historic properties near the Project site in New York, the Masters Printers Building and the High Line. In addition,

In accordance with 36 CFR § 800.14(b)(3), FRA developed detailed measures to avoid, minimize, and/or mitigate adverse effects that are included in a Section 106 Programmatic Agreement (PA). These measures were developed through consultation between FRA, NJHPO, NYSHPO, the Advisory Council on Historic Preservation, FTA, Amtrak, and the PANYNJ, as well as other consulting parties to the PA as part of the Section 106 process. The PA is provided in Appendix 9 to the FEIS.

Therefore, the Preferred Alternative would promote this policy.

10.2 *Protect and preserve archaeological resources and artifacts.*

As discussed in Chapter 9 “Historic and Archaeological Resources,” the Preferred Alternative would result in an adverse effect on the Hudson River Bulkhead (discussed in Policy 10.1) and Project-related construction activities in New York would affect areas that have the potential to contain buried archaeological resources. The PA developed through Section 106 consultation stipulates detailed measures to avoid, minimize, and/or mitigate these potential adverse effects. Therefore, the Preferred Alternative would be consistent with this policy. *