Chapter 9

9.1 INTRODUCTION

This chapter evaluates the potential for the No Action and Build Alternative to affect historic resources, including historic architectural and archaeological resources. This chapter summarizes the findings of the Historic Architectural Resource Background Study (HARBS) and Effects Assessment (EA) Report (RGA 2017a), the Supplemental Information for the HARBS and EA Report (RGA 2017b), the Phase 1A Archaeological Survey (RGA 2017c), and the Supplemental Information for the Phase IA Survey (RGA 2017d) that were prepared for the proposed Project and are included in Appendix C, "Historic Resources." This chapter focuses on the potential for the Build Alternative to impact historic resources.

9.2 REGULATORY CONTEXT AND METHODOLOGY

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as implemented by federal regulations appearing in 36 CFR Part 800, mandates that federal agencies consider the effect of their actions on any properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. The Section 106 review process requires consultation with the New Jersey Historic Preservation Office (NJHPO) in order for FTA to determine whether a project may directly or indirectly alter characteristics of a historic property that qualifies it for inclusion in the NRHP, which would constitute an "adverse effect." Agency and public input are essential to inform federal decision-making in the Section 106 process, and the public and agency participation efforts that have been conducted for this Project are described in Chapter 21, "Agency Coordination and Public Participation." Correspondence documenting the Section 106 consultation process is included in Appendix C, "Historic Resources."

The analysis for historic resources was conducted following the Section 106 consultation process and includes the following steps:

- Delineate the Area of Potential Effects (APE)- above ground (architectural resources) and APEbelow ground (archaeological resources) in consultation with the NJHPO via a Section 106 Project Initiation Letter; identify consulting and interested parties; and conduct agency and public outreach;
- Prepare a HARBS/EA that complies with Section 106 and NJHPO's current guidelines for historic architectural surveys, which includes identification of known resources, surveys of resources that are potentially eligible for listing in the NRHP, and an effects assessment for the historic resources that are eligible for or listed in the NRHP and are within the APE-above ground;

- Prepare a Phase IA archaeological survey for the APE-below ground that complies with Section 106 and NJHPO's requirements to assess the potential for significant archaeological resources to be encountered during construction of the Build Alternative, which would determine the need for a Phase IB survey. A Phase IB survey entails shovel tests, soil borings and analysis, and/or determination of a need for archaeological monitoring during construction;
- Consult with the NJHPO and FTA-approved consulting parties, which includes submitting the HARBS/EA report and Phase IA archaeological survey to NJHPO and consulting parties for review, submitting the Supplemental Information for the HARBS/EA report and Supplemental Information for the Phase IA archaeological survey to NJHPO for review, and concurrence on the findings; and
- As warranted, negotiate and execute a Section 106 agreement between NJHPO, FTA and NJ TRANSIT. The NJHPO made a determination of an adverse effect. At FTA's direction a Programmatic Agreement (PA) will be executed to define the measures to be undertaken to avoid, minimize, and/or mitigate the adverse effects of the proposed Project on historic resources.

9.2.1 Definition of APE

As defined under Section 106, the APE is: "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE for the proposed Project includes locations that may potentially be impacted by construction, or that may experience effects once construction is completed. The APE-below ground includes all locations of potential ground disturbance for construction of all project components. To account for potential contextual (visual) effects, the APE-above ground extends beyond the actual construction limits of the proposed Project to include those properties that may be impacted by visual changes, patterns of use, or may experience a change in historic character associated with the construction of the proposed improvements.

The Final Scoping Document for the proposed Project, dated May 2016, outlined a foundation for initiating Section 106 consultation. It stated that the APE-above ground would likely be an area within 1,000 feet or less from new construction, while the APE-below ground would likely be limited to areas directly impacted by construction activity. In coordination with FTA and NJHPO, the project team used electronic viewshed mapping, computer-generated simulations of new poles, and field reconnaissance to refine and delineate a more precise APE-above ground. Based on the anticipated project viewshed, this effort produced a preliminary APE-above ground of 1,000 feet from the proposed Project. In a few areas, the APE-above ground was extended up to 1,650 feet from Preferred Alternative Project Components C, D, and E in the industrial areas of Kearny and Jersey City to fully encompass entire tax parcels or to compensate for open areas of high visibility. NJ TRANSIT submitted this preliminary APE-above ground to the NJHPO and FTA for approval. In a letter dated March 30, 2016, the NJHPO concurred with the APE-above ground as delineated. FTA concurred with the APE-above ground on May 20, 2016.

Following the approval of the APE-above ground, the project design continued to evolve and several changes in project elements warranted revisions to the APE-above ground. The APE-above ground in Kearny was expanded upon determination of a maximum 220-foot height for the proposed new monopoles. A previously proposed electrical line route through an abandoned Conrail-owned tunnel and along Hoboken Avenue was relocated, and the APE-above ground was adjusted accordingly. Similarly, the APE-above ground was extended south of Hoboken Avenue to include the project components along the New Jersey Turnpike right-of-way. As discussed in more detail below, project components along the New Jersey Turnpike right-of-way are no longer proposed.

The HARBS and EA Report (RGA 2017a), the Supplemental Information for the HARBS and EA Report (RGA 2017b), the Phase 1A Archaeological Survey (RGA 2017c), and the Supplemental Information for the Phase IA Survey (RGA 2017d), undertook analyses of the for the effect of the Build Alternative on historic resources within the APE-above ground and APE-below ground. After the completion of these reports, the portion of the project along the New Jersey Turnpike right-of-way and the NJ TRANSIT easement in northern Jersey City (identified as Project Component F – Section 1 in Supplemental Information for the Phase IA Survey [RGA 2017d]) was eliminated as a potential project alternative. The boundaries of the APE for historic resources represented in figures in this section continue to include the New Jersey Turnpike right-of-way and NJ TRANSIT easement, due to the previous NJHPO concurrence of the APE, as described above. The descriptions of Project Components and analyses of archaeological sensitivity and recommendations for archaeological work, however, reflect the current design plans.

To account for the inclusion of the new electrical line along the HBLR corridor, NJ TRANSIT developed an additional APE-above ground for Preferred Alternative Project Component G in coordination with FTA and NJHPO. Due to the nature of the undertaking, the surrounding environment, and the limited height of the proposed poles, the APE-above ground for Project Component G was limited to an area within 500 feet from the proposed electrical line alignment. Electronic viewshed mapping and field reconnaissance were employed as tools to guide which buildings within the APE-above ground warranted survey based on potential visual effects. Utilizing ArcGIS 3D analyst software, Digital Elevation Models (DEM) were used to create viewshed mapping for the area within the 1,000-foot-wide corridor based on the maximum pole height of approximately 39 feet for any new poles. Field reconnaissance was conducted on January 26 and 27, 2017 to assess existing conditions and to check sightlines from various vantage points along the HBLR corridor between the Township of North Bergen and the City of Bayonne. The preliminary APEabove ground for Project Component G was submitted to the NJHPO for approval by NJ TRANSIT on February 8, 2017. On February 28, 2017, the NJHPO requested revisions to clarify the extent of the APEabove ground along the HBLR corridor. NJ TRANSIT submitted a revised APE-above ground for Preferred Alternative Project Component G for approval on March 7, 2017. On March 15, 2017, the NJHPO concurred with the revised APE-above ground for Preferred Alternative Project Component G. FTA concurred with the APE-above ground for HBLR on June 15, 2017. The APE is presented on Figures 9-1 and 9-2.



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9.2.2 National Register Criteria

The National Register defines four specific criteria for evaluation of historic resources (NPS 2016). These criteria are:

- Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: Associated with the lives of significant persons in our past; or
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: Yielded or may be likely to yield, information important in history or prehistory.

9.3 AFFECTED ENVIRONMENT

The Phase IA and HARBS/EA reports identified 80 historic resources within the APE-above ground and APE-below ground listed in or eligible for listing in the NRHP (see Table 9-1 and Figures 9-3 through 9-8) for the Build Alternative. Of the 80 identified historic resources, 78 are historic architectural resources, of which 25 are historic districts, two are historic streetscapes, and 51 are historic properties. The identified historic resources within the APE-above ground and APE-below ground for the Build Alternative are discussed below.

9.3.1 Historic Architectural Resources

The majority of resources within the APE-above ground are located outside of the construction footprint of the Build Alternative. Table 9-1 lists all historic architectural resources within the APE-above ground that are NRHP-listed or that have been evaluated as being eligible for the NRHP by the NJHPO or the HARBS completed in connection with the proposed Project. This list includes both resources that may be indirectly or directly affected by the project. Only the historic resources that may be directly affected by the undertaking and those that are likely to be adversely affected by contextual impacts are described below.















Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
1	Old Main Delaware, Lackawanna and Western Railroad Historic District	Multiple	Eligible (NJHPO Opinion: 9/24/1996)	Adverse effect	Fig. 9-3, 9-4, 9-5
2	Pennsylvania Railroad New York to Philadelphia Historic District	Multiple	Eligible (NJHPO Opinion: 10/2/2002)	No adverse effect	Fig. 9-4, 9- 6
3	Pennsylvania Railroad New York Bay Branch Historic District	City of Newark	Eligible (NJHPO Opinion: 4/22/2005)	No adverse effect	Fig. 9-4
4	Essex Generating Station	Town of Kearny; City of Newark	Eligible (NJHPO Opinion: 3/23/2015)	No adverse effect	Fig. 9-4
5	PSE&G Kearny- Essex-Marion Interconnection Historic District	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 12/31/2013)	No adverse effect	Fig. 9-3, 9- 4, 9-5
6	Jersey City Water Works Historic District	Multiple	Eligible (NJHPO Opinion: 1/20/2003)	No effect provided direct project impacts avoided	Fig.9-3, 9- 4, 9-5, 9-6
7	Hackensack River Lift Bridges Historic District	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 5/3/2002)	Adverse effect	Fig. 9-3, 9- 5
8	People's Gas Light Company/PSE&G Marion Office Historic District	City of Jersey City	Eligible (NJHPO Opinion: 3/10/1999)	No adverse effect	Fig. 9-5
9	Delaware, Lackawanna and Western Railroad Boonton Line Historic District	Multiple	Eligible (NJHPO Opinion: 9/18/2008)	Adverse effect	Fig. 9-5, 9- 6
10	US Route 1 Extension [Pulaski Skyway] Historic District	Multiple	Listed (NJR: 6/13/2005; NRHP: 8/12/2005)	No adverse effect	Fig. 9-5
11	US Routes 1&9 Historic District	Multiple	Eligible (NJHPO Opinion: 3/8/1996)	No adverse effect	Fig. 9-5

Table 9-1 Eligible and Listed Historic Resources*

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
12	New Jersey Midland Railway/New York, Susquehanna and Western Railroad Historic District	Multiple	Eligible (NJHPO Opinion: 4/25/2006 & 1/30/2015)	No adverse effect	Fig. 9-5 <i>,</i> 9-6
13	Erie Railroad Main Line Historic District	Multiple	Eligible (NJHPO Opinion: 2/20/2003)	No adverse effect	Fig. 9-5, 9-6
14	Erie Railroad Bergen Archways Historic District	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
15	Hudson and Manhattan Railroad Transit System (PATH) Historic District	Multiple	Eligible (NJHPO Opinion: 3/4/2002)	No adverse effect	Fig. 9-5, 9-7
16	Hoboken Historic District	City of Hoboken	Eligible (NJHPO Opinion: 12/12/2016)	No adverse effect	Fig. 9-5 <i>,</i> 9-6
17	Substation 4	Town of Kearny	Eligible (NJHPO Opinion: 9/12/1994)	No adverse effect	Fig. 9-4
18	Edison Battery Company Property	Town of Kearny	Eligible (NJHPO Opinion: 4/8/2008)	No adverse effect	Fig. 9-3, 9-4
19	Jersey City Water Works Pipeline	City of Jersey City	Eligible (NJHPO Opinion: 5/7/1999)	No effect provided direct project impacts avoided	Fig. 9-3, 9-4, 9-5
20	PSE&G Kearny Generating Station	Town of Kearny	Eligible (NJHPO Opinion: 5/3/2002)	No adverse effect	Fig. 9-4
21	Lower Hack Draw Bridge	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 9/18/1996)	Adverse effect	Fig. 9-5
22	Wittpenn Bridge [SI&A #0909150]	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 2/7/2001)	No adverse effect	Fig. 9-3
23	Pennsylvania Railroad Harsimus Branch (Conrail/CSX) Bridge over the Hackensack River	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 5/3/2002)	No adverse effect	Fig. 9-3

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
24	Pennsylvania Railroad (PATH) Bridge over Hackensack River	Town of Kearny; City of Jersey City	Eligible (NJHPO Opinion: 5/3/2002)	No adverse effect	Fig. 9-3, 9-4
25	St. Peter's Cemetery	City of Jersey City	Eligible (NJHPO Opinion: 6/18/1996)	No adverse effect provided direct project impacts avoided	Fig. 9-5
26	West End Interlocking Tower	City of Jersey City	Eligible (NJHPO Opinion: 1/20/1999)	Adverse effect	Fig. 9-5
27	West-End Through Truss Bridges	City of Jersey City	Eligible (NJHPO Opinion: 3/31/1997)	Adverse effect	Fig. 9-5
28	Old and New Bergen Tunnels	City of Jersey City	Eligible (NJHPO Opinion: 5/8/1998)	Adverse effect	Fig. 9-5
29	JFK Boulevard Bridge [SI&A # 0951170]	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
30	Erie Railroad Bergen Hill Tunnel [aka Long Dock Tunnel]	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
31	Palisade Avenue Bridge [SI&A # 0951165]	City of Jersey City	Eligible (NJHPO Opinion: 4/27/2000)	No adverse effect	Fig. 9-5
32	Jersey City High School [William Dickinson High School]	City of Jersey City	Listed (NJR: 12/23/1981; NRHP: 6/1/1982)	No adverse effect	Fig. 9-5
33	Holbrook Manufacturing Company	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5
34	Continental Can Company Complex	City of Jersey City	Eligible (NJHPO Opinion: 5/30/1997)	No adverse effect	Fig. 9-5
35	Lackawanna Warehouse and Viaduct	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-5
36	Grove Street Bridge	City of Jersey City	Eligible (NJHPO Opinion: 1/20/1999)	No adverse effect	Fig. 9-5
37	Engine Company #3, Truck #2 Firehouse	City of Jersey City	Listed (NJR: 2/9/1984; NRHP: 3/30/1984)	No adverse effect	Fig. 9-5
38	Erie-Lackawanna Terminal	City of Hoboken	Listed (NJR: 12/7/2004; NRHP: 2/17/2005)	No adverse effect	Fig. 9-5

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
39	Covert/Larch Historic District	City of Jersey City	Eligible (NJHPO Opinion: 3/10/1999)	No effect provided direct project impacts avoided	Fig. 9-5
40	Mechanic's Trust Company	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
41	Bayonne Trust Company	City of Bayonne	Listed (NJR: 4/20/2006; NRHP: 8/8/2006)	No adverse effect	Fig. 9-8
42	East 17th Street Apartment Buildings Streetscape	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
43	Maidenform Brassiere Company	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
44	East 19th Street Streetscape	City of Bayonne	Eligible (NJHPO Opinion: 12/9/1994)	No adverse effect	Fig. 9-8
45	Mount Carmel Historic District	City of Bayonne	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-8
46	YMCA of Bayonne	City of Bayonne	Eligible (NJHPO Opinion: 5/5/1997)	No adverse effect	Fig. 9-8
47	Public School Number 5	City of Bayonne	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-8
48	Morris Canal	Multiple	Listed (NJR: 11/26/1973; NRHP: 10/1/1974)	No effect provided direct project impacts avoided	Fig 9-7, 9-8
49	Lehigh Valley Railroad Historic District	Multiple	Eligible (NJHPO Opinion: 3/15/2002)	No adverse effect	Fig. 9-8
51	Hanover National Bank Repository	City of Jersey City	Eligible (COE: 5/18/2006)	No adverse effect	Fig. 9-7
52	Communipaw- Lafayette Historic District	City of Jersey City	Eligible (NJHPO Opinion: 2/17/1995)	No adverse effect	Fig. 9-7
53	Ocean Avenue Bridge (SI&A #0950163)	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-7
54	Bergen Avenue Bridge (SI&A #0900011)	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-7
55	Former Candy Factory	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-7
F.C.	Paulus Hook	City of Jersey	Listed (NJR: 8/7/1981;	No adverse	

NRHP: 6/21/1982)

56

Historic District

City

Fig. 9-7

effect

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
57	Van Vorst Park Historic District	City of Jersey City	Listed (NJR: 8/21/1984; NRHP: 10/11/1984)	No adverse effect	Fig. 9-5, 9- 7
58	One Exchange Place (Bank Building)	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-7
59	Commercial Trust Company Bank	City of Jersey City	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-7
60	Hudson and Manhattan Railroad Powerhouse	City of Jersey City	Listed (COE: 10/7/1999; NRHP: 11/23/2001)	No adverse effect	Fig. 9-7
61	Warehouse Historic District	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5 <i>,</i> 9- 7
62	Great Atlantic and Pacific Tea Company Warehouse	City of Jersey City	Listed (NJR: 6/2/1978; NRHP: 6/2/1978; NHL 6/2/1978)	No adverse effect	Fig. 9-7
63	Butler Brothers Warehouse	City of Jersey City	Listed (NJR: 10/26/2015)	No adverse effect	Fig. 9-7
64	Holland Tunnel	City of Jersey City	Listed (NJR: 10/13/1995; NRHP: 11/4/1993; NHL 11/3/1993)	No effect provided direct project impacts avoided	Fig. 9-5
66	Pohlmann's Hall	City of Jersey City	Listed (NJR: 7/5/1985; NRHP: 9/5/1985)	No adverse effect	Fig. 9-5
67	269-271 Ogden Avenue	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5
68	268-272 Ogden Avenue	City of Jersey City	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-5
69	Ferguson Brothers Manufacturing Company	City of Hoboken	Eligible (NJHPO Opinion: 10/16/1998)	No adverse effect	Fig. 9-5
70	Old Hillside Road Trolley Horseshoe Curve	Multiple	Eligible (NJHPO Opinion: 5/21/1999)	No adverse effect	Fig. 9-6
71	North (Hudson) River Tunnels	Multiple	Eligible (NJHPO Opinion: 11/12/1998)	No adverse effect	Fig. 9-6
72	NJ Route 3 (NJ 495) Highway Approach to Lincoln Tunnel Historic District	Weehawken Township	Eligible (NJHPO Opinion: 11/17/1999)	No adverse effect	Fig. 9-6
73	NJ Route 495 Viaduct (SI&A 3800031)	Weehawken Township	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-6

Resource ID*	Property Name/ Address	Municipality	NRHP Current Status	Effects Assessment	Location Reference Figure
74	Lincoln Tunnel Entrance and Ventilation Buildings	Weehawken Township	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-6
75	Lincoln Tunnel	Weehawken Township	Eligible (NJHPO Opinion: 2/25/2003)	No adverse effect	Fig. 9-6
76	King's Bluff Historic District	Weehawken Township	Eligible (NJHPO Opinion: 5/16/1995)	No adverse effect	Fig. 9-6
77	West Shore Railroad Tunnel	Multiple	Eligible (NJHPO Opinion: 2/28/1991)	No adverse effect	Fig. 9-6
78	New York, Susquehanna and Western Railroad Engine Repair Site (28-Hd-48)	City of Jersey City	Eligible (NJHPO Opinion: 1/30/2015)	No effect provided direct project impacts avoided	Fig, 9-5
79	Standard Chlorine Chemical Company Site (28-Hd-44)	Town of Kearny	Eligible (NJHPO Opinion: 5/22/2012)	No effect provided direct project impacts avoided	Fig. 9-3, 9- 4
80	Substation No. 41	Town of Kearny	Eligible (NJHPO Opinion: 4/24/2018)	No effect	Fig. 9-4
RGA25	Belvedere Court	City of Jersey City	Eligible (NJHPO Opinion: 4/24/2018)	No adverse effect	Fi. 9-5
RGA48	R. Neumann & Co. Factory Complex	City of Hoboken	Eligible (NJHPO Opinion: 12/9/2016)	No adverse effect	Fig. 9-5

*Resource ID numbers based on HARBS numbering; additional, sequential resource ID numbers 78, 79, and 80 given to resources which were not part of the HARBS. Resource ID numbers 39, 78, and 79 are archaeological resources, and Resource ID 80 was identified by the NJHPO in their review letter dated April 24, 2018 (HPO-D2018-122 PROD). Resource ID 65, L.O. Koven & Brothers Sheet Iron and Plate Steel Works, was identified by NJHPO as no longer eligible for the NRHP in their review letter dated April 24, 2018 (HPO-D2018-122 PROD). Resource ID 50, Pennsylvania Railroad New York Bay Branch Historic District, was a duplicate of Resource ID 3.

Old Main Delaware, Lackawanna, and Western Railroad Historic District (Morris & Essex Line)

The Old Main Delaware, Lackawanna and Western Railroad (DL&W) Railroad Historic District (Resource ID 1) is eligible for listing in the NRHP under Criterion A for its association with suburbanization, as well as for commuter, passenger, and freight traffic. The construction of the line advanced the development of suburban communities in northern New Jersey by providing accessible transportation into New York City via the ferries at Hoboken. The resource is also eligible for listing in the NRHP under Criterion C for its contributions to the field of engineering. The construction of the line across the challenging terrain of northern New Jersey required the construction of numerous bridges and tunnels. Most notably, the railroad undertook a major rebuilding effort in the early twentieth century that involved a pioneering and comprehensive use of concrete construction technology.

The historic district extends over 80 miles across New Jersey, from the Hudson River at the east end to the Delaware River at the west end. Approximately 4.5 miles of the Old Main DL&W Railroad Historic District are encompassed within the proposed Project area. Numerous contributing resources have been identified within the Old Main DL&W Railroad Historic District. Contributing property types include railroad stations, bridges, tunnels, interlocking towers and signal equipment, culverts, catenary and electrical system structures, civil engineering features (cuts, fills, embankments, retaining walls), railway yard facilities, and branch or side tracks. Multiple contributing resources are located within the APE-above ground.

Other contributing components of the Old Main DL&W Railroad Historic District include the Old and New Bergen Tunnels (through which Preferred Alternative Project Component E would extend) as well as bridges and other structures. Tunnels, bridges, and other structures that are within the Old Main DL&W Railroad Historic District that are individually eligible for or listed in the NRHP and would be potentially directly affected by the proposed Project are described in detail below.

Hackensack River Lift Bridges Historic District

The Hackensack River Lift Bridges Historic District (Resource ID 7) includes four individually eligible bridges: Lower Hack Draw Bridge, Wittpenn Bridge, Pennsylvania Harsimus Branch Bridge, and Pennsylvania Railroad Bridge. All four are post-World War I vertical lift bridges that are eligible under NRHP Criteria A and C in the areas of Transportation and Engineering. Of the four individually eligible bridges, the Lower Hack Draw Bridge is also a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District. The district represents largely unaltered, operable, and increasingly rare examples of historically and technologically significant bridge types. The district's period of significance is 1928 to 1930.

Lower Hack Draw Bridge

The Lower Hack Draw Bridge (Resource ID 21) is a vertical lift bridge designed and built in 1927 by internationally-renowned engineer John Alexander Low Waddell. The bridge carries three railroad lines across Duffield Avenue in Jersey City and the Hackensack River. Both reinforced concrete and steel comprise the structural components of the bridge. In January of 1999, the Lower Hack Draw Bridge was

determined individually eligible for listing in the NRHP under Criteria A and C; however, the SHPO Opinion of Eligibility did not specify under which areas of significance the resource is eligible. The bridge is also a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District and the NRHP-eligible Hackensack River Lift Bridges Historic District.

West End Interlocking Tower

The West End Interlocking Tower (Resource ID 26), located along Preferred Alternative Project Component E, was built in 1909 and was used to control the junction between the DL&W Railroad Boonton Line and the Morris & Essex Line. At present, the tower is used as office and storage space for rail maintenance and no longer functions as an interlocking tower. The West End Interlocking Tower was determined individually eligible for listing in the NRHP under Criteria A and C in the areas of Transportation, Engineering and Architecture. The West End Interlocking Tower is a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District.

West-End Through Truss Bridges

Built in 1908 for the DL&W Railroad, the steel West-End Through Truss Bridges (Resource ID 27), part of Preferred Alternative Project Component E, at milepost 1.89 on the Morris & Essex Line carry two rail lines at the West End of the Bergen Tunnel. The bridges span the former Erie Railroad tracks that emerge from the adjacent Erie Tunnel under Bergen Hill. The West-End Through Truss Bridges are the only trusses surviving on this particular rail line and are technologically significant as an example of heavy trusses used in railroad construction. The truss bridges were determined individually eligible for listing in the NRHP under Criteria A and C in the areas of Transportation and Engineering. The West-End Through Truss Bridges are contributing resources to the NRHP-eligible Old Main DL&W Railroad Historic District.

Old and New Bergen Tunnels

The Old and New Bergen Tunnels (Resource ID 28), part of Preferred Alternative Project Component E, are parallel tunnels that cut through the trap rock of Bergen Hill and each carry two rail lines. Built in 1876 by the DL&W Railroad, the Old Bergen Tunnel measures 4,278 feet in length, 27 feet in width, and 19 feet in height. The New Bergen Tunnel was built in 1908 and measures 4,281 feet in length, 30 feet in width, and 23 feet in height. The old tunnel carries the westbound tracks for the Morris & Essex Line while the new tunnel carries the eastbound tracks. The Old Bergen Tunnel is technologically significant for its association with the development of transportation and commerce in the late nineteenth century, and the New Bergen Tunnel is technologically significant for the innovative use of concrete in response to an increase in railroad freight operations during the early twentieth century. The Old and New Bergen Tunnels were determined eligible for listing in the NRHP under Criteria A and C in the areas of Transportation and Engineering. The tunnels are contributing resources to the NRHP-eligible Old Main DL&W Railroad Historic District.

Delaware, Lackawanna and Western Railroad Boonton Line Historic District

The Delaware, Lackawanna & Western Railroad (DL&W) Railroad Boonton Branch Historic District (a.k.a. NJ TRANSIT Main Line; Resource ID 9) is eligible for listing in the New Jersey Register of Historic Places (NJR) and NRHP under Criteria A and C for its associations with freight and passenger service, and for spurring the growth and development of industries and residences along the alignment (Saunders 2008). The DL&W Railroad leased the Morris & Essex Railroad (M&ERR) in 1868, then constructed and opened the so-called Boonton Cut-off in 1869-1870 to channel coal and freight traffic off the old M&ERR main line between Boonton and Hoboken. The Boonton Branch was built to the highest engineering standards of the day with gentle grades, long tangents, and generous curves for the efficient movement of freight. Construction and operation of the branch helped to solve problems with freight congestion and geographic impediments on the former M&ERR main line. The resource is distinguished from, but connected to, the NRHP-eligible Old Main DL&W Railroad Historic District.

9.3.2 Archaeological Resources

There are several below-ground resources eligible for listing in the NRHP located within and in close proximity to the APE-below ground. Some of these resources, such as the Jersey City Water Works Historic District, are historic architectural resources that were designed to be constructed below-ground. All historic resources located below ground are included within the Phase 1A Archaeological Survey (RGA 2017c) and the Supplemental Information for the Phase IA Survey (RGA 2017d), and are discussed along with the other archaeological resources.

The Jersey City Water Works Pipeline and Historic District

The Jersey City Water Works Historic District (Resource ID 6), part of Preferred Alternative Project Components C and D, was determined eligible for listing in the NRHP under Criteria A, C, and D for its associations with the early twentieth century urban reform movement, its engineering significance, and its potential to yield important historical information on nineteenth-century civil engineering technology and construction. The Jersey City Water Works Pipeline (Resource ID 19) is individually eligible for listing in the NRHP for its potential to yield important information regarding mid-nineteenth century public works engineering and construction. The pipeline consists of a 20-inch pipe built in 1854 and a 36-inch pipe built in 1863 from the Passaic River to Jersey City, both of which are original components of the NRHP-eligible Jersey City Water Works Historic District. The documented location of the Jersey City Water Works Pipeline bisects Project Components C and D where the Morris & Essex Line crosses underneath the Newark-Jersey City Turnpike (Route 7). The Jersey City Water Works Historic District enters Preferred Alternative Project Component A near the Route 7 off-ramp, runs east-southeast toward the Morris & Essex Line, then follows a nearly parallel route along the northern boundary of Preferred Alternative Project Component E to the Jersey City Reservoir 2 and 3 Complex in Jersey City.

St. Peter's Cemetery

Located in Jersey City adjacent to the west of Route 1&9, St. Peter's Cemetery (Resource ID 25) is a Roman Catholic burial ground with interments beginning with the cemetery's creation in 1849. The cemetery has

minimal landscaping and is surrounded by a chain link fence. St. Peter's Cemetery was determined eligible for listing in the NRHP at the local level in 1996 under Criterion A as Jersey City's first burial ground dedicated to the Roman Catholic community. St. Peter's Cemetery lies to the north adjacent to Preferred Alternative Project Component E, east of the Lower Hack Draw Bridge.

The Covert/Larch Historic District

Six archaeological sites contribute to the circa nineteenth century Covert/Larch Historic District (Resource ID 39): the Beck/Thorpe/Altvatter House Sites (28-Hd-20), the Gavenesch/Balbo House/Store Site (28-Hd-21), the Gavenesch/D'Amato House/Saloon Site (28-Hd-22), the Gavenesch/Sarno House Site (28-Hd-23), the Radcliffe/Hoersch House Site (28-Hd-24), and the Moore/Bukowski House Site (28-Hd-25). A cultural resources survey completed by the RBA Group in 2000 recommended archaeological data recovery for the six contributing archaeological sites within the Covert/Larch Historic District. The Covert/Larch Historic District was determined eligible for NRHP listing under Criterion D for its potential to yield important information regarding late nineteenth century working class community behaviors. The Covert/Larch Historic District lies to the south adjacent to Preferred Alternative Project Component E, east of the Lower Hack Draw Bridge.

Morris Canal

The Morris Canal (Resource ID 48), which was completed in 1836 after little more than a decade of construction, was listed on the (NJR) and NRHP in the early 1970s as a linear historic district. The period of significance for the Morris Canal begins in 1824, the year the Morris Canal and Banking Company obtained a charter, and ends in 1923, the year ownership of the Morris Canal was transferred to the State of New Jersey from the Lehigh Valley Railroad. The canal is significant under Criterion A for its association with canal transportation, American technical education, and the demographic and industrial growth in northern New Jersey, New York City, and the Lehigh Valley. Because several inventors, engineers, and important men were associated with the construction and operation of the canal, the canal is significant under Criterion B. The Morris Canal meets Criterion C as a major technological feat of construction and operation, including the inclined plane design. As the resource is located entirely below ground in the vicinity of the APE, the project would not result in any visual or contextual effects upon the Morris Canal. Below ground, the resource passes directly beneath the New Jersey Turnpike (formerly part of Project Component F) in one location and under Project Component G in four locations. The below-ground components of the resource contain potential information relating to canal engineering and construction as well as the lifeways of nineteenth-century canal culture.

The New York, Susquehanna, and Western Railroad Engine Repair Site

The NYS&W Railroad Engine Repair Facility and Yard (Resource ID 78) is documented on maps dating between the early 1880s and 1913 at the northeast corner of St. Paul's Avenue and West Side Avenue south the of the Old Main DL&W Railroad Historic District. Structural remains of the engine repair building and the southern perimeter of the turntable were identified and registered as New York Susquehanna and Western RR Engine Repair Site (28-Hd-48), and recommended NRHP eligible. The NYS&W Railroad

Engine Repair Site lies south of Preferred Alternative Project Component E, east of the Lower Hack Draw Bridge.

The Standard Chlorine Chemical Company Site

The Standard Chlorine Chemical Company (SCCC) Site (Resource ID 79) (28-Hd-44) is an intact and deeply buried prehistoric archaeological site bordered by the Hackensack River to the east, the Northeast Corridor to the north, Route 7 to the west and the Koppers Koke Site to the south. The site was identified during construction of a slurry wall between nine and 17 feet below ground surface on a former well-drained sandy upland that was buried by sea level inundation. A peat layer overlying the sandy upland was radiocarbon dated to AD 1160 to AD 1260. It was determined eligible for NRHP listing under Criterion D for its potential to add important information on Woodland Period Native American exploitation of the Hackensack River drainage. The sandy upland is hypothesized to represent a stable Early to Middle Holocene floodplain with potential to contain evidence of human occupation through the early Late Holocene. Site 28-Hd-44 lies outside of the APE-below ground to the northwest.

9.4 PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

9.4.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed. With or without the proposed Project, NJ TRANSIT intends to acquire the 20-acre parcel (Preferred Alternative Project Component A) on the Koppers Koke Site as well as the six-acre parcel (Preferred Alternative Project Component B). As explained in Chapter 2, "Project Alternatives", this acquisition is moving forward as part of a property settlement agreement between NJ TRANSIT and HCIA. Therefore, in the absence of the proposed Project, it is likely these portions of the Koppers Koke Site would be used for ancillary railroad purposes such as storage or parking. Under the No Action Alternative, there would be a missed opportunity to educate commuters about the Historic District through interpretive exhibits and the comprehensive corridor study, as stipulated in the PA, would not be completed.

Several major transportation initiatives for which commitment and financing have been identified would proceed, resulting in various changes to some of the resources described above. NJDOT is currently replacing the Route 7 Wittpenn Bridge (NRHP-eligible) over the Hackensack River, along with its approach ramps. That project is expected to be completed by 2022. Multiple state-of-good-repair projects would continue to be implemented along this segment of the Pennsylvania Railroad New York to Philadelphia Historic District (Northeast Corridor). Some of these projects will add to the extensive alterations of the Historic District since the time that it was determined NRHP-eligible. NJ TRANSIT's and Amtrak's Portal Bridge Capacity Enhancement Project, Amtrak's Sawtooth Bridges Replacement Project, and other projects along the Northeast Corridor in the area would remove or alter features that contribute to the historic character of the Pennsylvania Railroad New York to Philadelphia Historic District. Therefore, under the No Action Alternative, it is likely that the integrity of the Historic District would continue to be diminished, but that the Historic District would remain NRHP-eligible. Additionally, as described in Chapter 2, in the absence of the proposed Project, Amtrak has plans to construct the new Kearny Substation and completely replace and rebuild Substation No. 41 to make it less susceptible to flooding. This effort would

include the removal of the existing lattice towers in Cedar Creek Marsh South and the installation of new monopoles.

9.4.2 Build Alternative

The Build Alternative would include the construction of the Main Facility (Preferred Alternative Project Component A), natural gas pipeline connection (Preferred Alternative Project Component B), electrical lines to Mason Substation (Preferred Alternative Project Component C), electrical lines and the new Kearny Substation (Preferred Alternative Project Component D), electrical lines and the New NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E), the nanogrid, consisting of emergency generators and energy storage at HBLR Headquarters on Caven Point Avenue (Preferred Alternative Project Component F), and the electrical lines proposed along the HBLR right-of-way (Preferred Alternative Project Component G). The preferred option for installation of electrical lines for Preferred Alternative Project Components C, D, E, and G would include a combination of new monopoles, underground duct banks and attachments to existing infrastructure (i.e., the HBLR elevated tracks).

All scenarios for potential direct and contextual impacts have been explored in detail in the HARBS/EA, Phase IA, and Supplemental reports. Resources with the potential to be directly affected and those that are likely to be adversely affected by contextual impacts are discussed in detail below. The effects on archaeological resources (including below-ground historic architectural resources) and above-ground historic resources presented herein are based on the 20 percent design. With regard to resources where direct project effects are possible but avoidable, this analysis recommends that project elements be designed in a manner that avoids direct impacts to character-defining features of these resources. Avoidance may include placement of monopoles or underground duct banks outside the estimated boundaries of resources and archaeological sensitivity areas, where construction may result in ground disturbance that could potentially damage or destroy elements of the resources, or installation of duct banks where shallow ground disturbance will would preclude disturbance of deeply buried archaeological resources. These conditions would be adhered to as the project engineering progresses, and as a result, the project would not result in adverse effects to these resources.

Archaeological Resources

The Koppers Koke Site where Preferred Alternative Project Component A would be constructed has a high sensitivity for prehistoric archaeological resources based on the presence of a deeply buried Early to Middle Holocene upland landform that contains a documented prehistoric archaeological resource. The limits of the Early to Middle Holocene upland landform are unknown and may extend into the APE-below ground. In addition, portions of the APE-below ground located within 500 feet of a perennial water source, on terrain documented historically as uplands and where limited ground disturbance has occurred have high sensitivity for prehistoric archaeological resources. Extensive areas of filled marshland are located within the APE-below ground. Installation of pile-driven foundations would have no adverse effect on the SCCC Site or undocumented prehistoric or historic archaeological resources, if any, within the APE since

no soil excavation beyond the recently placed fill material would result from the construction of the Main Facility.

Proposed construction of the Main Facility and related natural gas pipeline, sanitary sewer, and water supply connections within the utility easement (see Chapter 15, "Utilities") (Project Components A and B) are in the vicinity of the previously identified Jersey City Water Works Pipeline and Jersey City Water Works Historic District. Avoidance of these resources would be achieved through project design so that no ground disturbance activities, including trenching and shaft drilling, are undertaken in the mapped route of the Jersey City Water Works Pipeline and Jersey City Water Works Historic District.

Preferred Alternative Project Components C and D bisect the Jersey City Water Works Pipeline at Route 7. Underground duct banks have the potential to adversely affect the Jersey City Water Works Pipeline. Preferred Alternative Project Component E runs parallel to the mapped location of the Jersey City Water Works Historic District from east of Route 7 to the Bergen Tunnel West Portal. While no contributing resources are identified in this portion of the Jersey City Water Works Historic District at this location, underground duct banks along the north side of Preferred Alternative Project Component E may have the potential to adversely affect the resource. Archaeological monitoring would be required if duct banks are proposed in areas of archaeological sensitivity associated with the Jersey City Water Works Pipeline and Jersey City Water Works Historic District. Duct banks located at grade (i.e., on the ground surface) would have no effect on archaeological resources.

Though no known archaeological resources are located within the proposed New Kearny Substation (Preferred Alternative Project Component D) footprint, this portion of the APE-below ground has high prehistoric archaeological sensitivity. Deeply buried Early to Middle Holocene upland landform soils that contain a documented prehistoric archaeological resource adjacent to the APE-below ground may extend into the new Kearny Substation portion of the APE-below ground. Installation of pile-driven foundations would have no adverse effect on any archaeological resources that may be present in the deeply buried upland soils since no soil removal would result from the installation.

Though no known archaeological resources are located along Preferred Alternative Project Component E, there is potential for archaeological sensitivity, including an area of prehistoric archaeological sensitivity where the potential for deeply buried upland soils exists. Areas of Preferred Alternative Project Component E have sensitivity for historic archaeological resources; documented below-ground historic resources include the Covert/Larch Historic District, the New York, Susquehanna and Western Railroad Engine Repair Site, and St. Peter's Cemetery.

Impacts on historic resources associated with the construction of the New NJ TRANSITGRID East Hoboken Substation (Preferred Alternative Project Component E) would include ground disturbance for the construction of monopole foundations and duct banks which may impact archaeological resources. This portion of the APE-below ground has areas of historic archaeological sensitivity.

There are no known below-ground archaeological resources within the HBLR Headquarters footprint, where Preferred Alternative Project Component F would be constructed. However, this portion of the APE-below ground has moderate prehistoric archaeological sensitivity. Prehistoric deposits associated

with two sites identified in the early twentieth century, located nearby to the northeast, potentially extend into the HBLR Headquarters portion of the APE-below ground. Installation of a pile-driven foundation for Project Component F would have no adverse effect on archaeological resources. Installation of underground duct banks or a shallow mat foundation would have no effect on archaeological resources within the APE-below ground, provided that ground disturbing activities do not disturb natural soils underlying surficial fill layers.

The Morris Canal is a below-ground architectural resource listed in the NRHP and located within or adjacent to Preferred Alternative Project Component G. However, as designed the proposed Project will avoid impacts to this resource as the largest portion of the Morris Canal is in the area of Jersey City where no new electrical lines would be installed due to the selection of Preferred Alternative Project Component F (the nanogrid at HBLR Headquarters). At remaining intersections with the Morris Canal, monopoles would be located specifically to avoid impact the resource. In addition to this resource, this portion of the APE-below ground along Preferred Alternative Project Component G has areas of prehistoric and historic archaeological sensitivity.

Impacts on historic resources associated with the construction of the new electrical lines associated with Preferred Alternative Project Components C, D, E, and G would include ground disturbance for the construction of duct banks and monopole foundations on archaeological resources. Installation of underground duct banks would have no effect on archaeological resources within the APE-below ground provided that ground disturbing activities do not disturb natural soils underlying surficial fill layers. In areas where underground duct bank excavation is planned in locations that have not been subject to fill or disturbance, archaeological monitoring would be required where excavation may impact archaeologically-sensitive areas. While monopoles are planned within archaeologically sensitive areas, the construction footprint associated with monopoles make stratigraphy difficult to observe and spoils from the drilling technique produce soils and artifacts in secondary contexts. Therefore, no further archaeological work (i.e., monitoring) is necessary at monopole locations.

Architectural Resources

Main Facility (Project Component A) and Natural Gas Pipeline Connection (Project Component B)

Preferred Alternative Project Component A as proposed would not directly affect any above-ground historic resources. The proposed exhaust stacks would be visible from multiple historic resources, the closest of which is the Old Main DL&W Railroad Historic District. Due to the heavy industrial and transportation uses that characterize this area of Kearny, the introduction of the Main Facility would not alter the setting of the surrounding historic districts to a degree that would adversely impact their character-defining features. The planned access option for Route 7 avoids direct impacts to above-ground historic resources. As site plans and plans for access roads in the vicinity of the Old Main DL&W Railroad Historic District are refined, direct impacts to the historic railroad right-of-way would be avoided to the extent feasible.

Preferred Alternative Project Component B would be constructed primarily underground and would therefore not have the potential to affect any above-ground historic resources. Provided that plans for Project Components A and B avoid direct impacts upon historic resources, and the NJHPO is given the opportunity to review and comment on any design updates or alterations, Preferred Alternative Project Components A and B would have no adverse effect on above-ground historic resources.

Electrical Lines (Project Components C, D, E, and G)

Impacts on historic resources associated with the construction of the new electrical lines would vary greatly based on the chosen installation method for specific areas. The combination of monopoles and underground duct banks was selected as the preferred design option based on various site-specific factors, such as access, site constraints, localized geology, areas of known contamination, and documentation/survey of existing utilities (both overhead and underground). Generally, construction can result in interruptions to public utilities and/or transportation service delays; therefore, the proposed Project is being designed to avoid these interruptions.

The option to install new monopoles along the length of the proposed electrical line has the potential to affect numerous cultural resources. Preferred Alternative Project Components C, D, and E would include poles up to 220 feet in height and up to 6 feet in diameter. The maximum 11 feet by 11 feet foundations for the poles in certain areas and could be installed along both sides of the railroad right-of-way. The optional routing for Project Component D (see Figure 9-4) would have a greater adverse impact on the NRHP-eligible Old Main DL&W Railroad Historic District in comparison to the Preferred Alternative Project Component D. This is because the optional routing travels along the Morris & Essex Line whereas the Preferred Alternative departs from the Morris & Essex Line and travels through the railyard. Monopoles potentially 220-feet in height in Preferred Alternative Project Components C and D would alter the scale of the built environment in the section of Kearny that is characterized by industrial development. East of the Hackensack River along Preferred Alternative Project Component E, proposed monopoles would be approximately 65 feet in height, with the exception of one monopole, which would be a maximum of 220 feet high and installed on the east bank of the Hackensack River, adjacent to existing electrical line poles. Monopoles proposed within Preferred Alternative Project Component G would be no more than 39 feet in height and would be similar in scale and character to existing utility poles that extend the length of the railroad right-of-way. Though the proposed 39-foot-tall monopoles would be visible from many resources within the APE-above ground, they would not noticeably alter the existing environment to a degree that would constitute an adverse impact on these resources.

More detailed plans for the locations of the monopoles would be developed in close coordination and consultation with NJHPO to avoid direct impacts to NRHP-eligible and NRHP-listed above- and below-ground resources, as well as resources that contribute to the overall significance of any NRHP-eligible and NRHP-listed historic districts. However, some of the new monopoles would be substantially taller than the rail corridor's existing catenaries and other infrastructure and would have a cumulative adverse effect on the NRHP-eligible Old Main DL&W Railroad Historic District because they would alter the visual identity of the rail corridor, which "has maintained a high level of integrity within the corridor right-of-way" (Marcopul 2017, HPO-D2018-122 PROD). Additionally, for the same reason, monopoles constructed as

part of Preferred Alternative Project Component E would have an adverse effect on the NRHP-eligible Old and New Bergen Tunnels, the NRHP-eligible West End Through Truss Bridges, the NRHP-eligible West End Interlocking Tower, the NRHP-eligible Hackensack River Lift Bridges Historic District, the NRHP-eligible Lower Hack Draw Bridge, and the NRHP-eligible DL&W Railroad Boonton Line Historic District. While the monopoles that would be installed as part of Preferred Alternative Project Component G would be visible from the resources identified within the APE-above ground, the monopoles would be similar in height to existing utility and other infrastructure and would have limited impacts on the character-defining elements that render historic resources along the corridor of Project Component G eligible for listing in the NRHP.

In order to satisfy the FTA's Section 106 responsibilities, the NJHPO was provided with the June 16, 2017 HARBS and EA Report that summarized actions proposed within the HBLR corridor. As indicated in the April 24, 2018 Consultation Comments provided by Katherine J. Marcopul, Deputy State Historic Preservation Officer, "the proposed Components F and G will not constitute an adverse effect on resources listed in or eligible for inclusion in the NJR and NR" (Marcopul 2017, HPO-D2018-122 PROD; Appendix C and D).

New Kearny Substation (Project Component D)

As currently designed, the proposed new Kearny Substation proximate to Substation No. 41, a contributing resource to the NRHP-eligible Old Main DL&W Railroad Historic District, would not result in an adverse effect to this historic resource. The proposed new substation would result in the removal of several existing elements of Substation No. 41, including several modern structures; however, much of Substation No. 41's historic elements including use, setting, and superstructure would remain, and the loss of two transformers believed to be the original is considered acceptable by the NJHPO (Marcopul 2017, HPO-D2018-122 PROD).

To the west of Substation No. 41, the historic Substation 4 building is individually eligible for listing in the NRHP as a representative example of the Pennsylvania Railroad's early electrification project. The proposed Project would not directly impact the Substation 4 building. While the context of this resource would be altered by the new Kearny Substation, the change would not be significant. The proposed Project would construct infrastructure elements in an area already dominated by railroad, utility, and industrial uses. The setting of Substation 4 would remain largely the same and New Kearny Substation would therefore not result in an adverse effect on historic resources.

Hackensack River Crossing (Project Component E)

For the proposed electrical lines to cross the Hackensack River, three options are currently being considered: (1) carried aerially by two monopoles (preferred option), (2) through a submerged submarine cable, or (3) directional drilling under the river bottom. For the aerial crossing, the proposed two monopoles would be built approximately 50 feet north of the Lower Hack Draw Bridge, within the Morris & Essex Line's right-of-way and be no taller than 220 feet, with a foundation consisting of reinforced concrete pole base measuring 6 feet in diameter and a depth of 95 feet below grade. The design of these two poles would be similar to the monopoles described above for Preferred Alternative Project

Components C and D. The two proposed monopoles that would be located near the western and eastern ends of the NRHP-eligible Lower Hack Draw Bridge would have a visual adverse effect on the bridge as well as on the NRHP-eligible Hackensack River Lift Bridges Historic District due to the height of the monopoles and their limited distances from the bridge.

The option to use directional drilling or submarine cable at the Hackensack River crossing would have effects on historic resources since structures would be required on either side of the Hackensack River for the transition from monopoles to underground electrical lines. The directional drilling option would install a cable underneath the Hackensack River sediments. The submarine cable option would involve directional drilling from the ground surface on the west bank to the river bottom, laying the cable directly on the river bottom, and directionally drilling from the ground surface on the east bank to the river bottom, to avoid impacts to shoreline resources. Whether located at grade or underground, this cable could affect the Old Main DL&W Railroad Historic District if it is installed within its boundaries. Directional drilling installation has the potential to adversely affect the Old Main DL&W Railroad Historic archaeological deposits that are potentially present beneath layers of fill on the east side of the Hackensack River. Submarine cable would likewise have the potential to adversely affect the Old Main DL&W Railroad Historic District. Due to the transition structures required for the electrical lines to be installed via directional drilling or submarine cable, these installation options would also have visual impacts on surrounding historic architectural resources in the APE-above ground since the structures would remain in place when the proposed Project is operational.

Bergen Tunnel (Project Component E)

New 65-foot tall monopoles are proposed for the segment of Preferred Alternative Project Component E immediately to the west of the NRHP-eligible Old and New Bergen Tunnels' western portal. As discussed above, introduction of these poles into the railroad corridor would alter its historic character and setting and would constitute a cumulative adverse effect on the historic resource. The route of the electrical line through the Old and New Bergen Tunnels, while having fewer visual impacts, would have a direct effect on the Old and New Bergen Tunnels. Direct effects would be limited to the New Bergen Tunnel (the south tunnel). The electrical line would be installed within a precast duct bank at grade between the northernmost track and the north wall of the tunnel. As proposed, the installation would not result in an adverse effect. The proposed duct banks would not have the potential to degrade important historic design elements of the tunnel.

New NJ TRANSITGRID East Hoboken Substation (Project Component E)

The new NJ TRANSITGRID East Hoboken Substation would have minimal visual impacts on surrounding historic architectural resources in the APE-above ground. These minimal visual intrusions would not have an adverse effect on above-ground historic resources.

Nanogrid (Project Component F)

At the HBLR Headquarters on Caven Point Avenue, the emergency generators and storage modules that would make up the nanogrid would be installed on an elevated platform estimated at seven feet above

ground surface to comply with NJ TRANSIT's Design Flood Elevation (DFE). The proposed platform is anticipated to be approximately 20,000 square feet and the emergency generators would be 10 to 14 feet tall, bringing the tallest point of the nanogrid less than 25 feet above nominal ground surface. Natural gas connections are already in place at the HBLR Headquarters facility. A combination of aerial and underground electrical lines on new monopoles less than 40 feet tall or duct banks within the NJ TRANSITowned property would connect the emergency generators to HBLR. While components of the nanogrid may be visible from nearby historic resources, they would not be adversely affected, as the proposed nanogrid would be compatible in scale and nature to the existing surroundings.

9.5 SUMMARY OF SIGNIFICANT ADVERSE IMPACTS AND MITIGATION MEASURES

The Phase IA archaeological survey determined that the APE-below ground has low to high sensitivity for prehistoric archaeological resources and historic archaeological resources. As project plans develop and the locations, nature and extent of the proposed Project's direct impacts are refined, further archaeological work may be required to identify the presence of archaeological resources within the APE-below ground. The installation of underground duct banks or construction of foundations for new monopoles along the length of Preferred Alternative Project Components C through E, as well as areas of archaeological sensitivity in Preferred Alternative Project Component G, would have the potential for direct impacts on prehistoric and historic archaeological resources, if any exist, within the APE-below ground. Avoidance of direct impacts include alterations to monopole placement, selection of installation options that involve shallow, rather than deep, ground disturbance, and the installation of at-grade duct banks.

Archaeological monitoring is proposed and is a stipulation of the draft PA, for those areas of archaeological sensitivity where the installation of utilities and/or duct banks is planned. If archaeological resources are identified during monitoring, additional archaeological site investigation would be necessary to evaluate the potential eligibility of the resource for NRHP listing. Several areas of archaeological sensitivity were identified along the New Jersey Turnpike right-of-way/ NJ TRANSIT Easement (former northern alignment of Project Component F – Section 1) and were recommended for archaeological monitoring in the previous Supplemental Information Report for the Phase IA (RGA 2017d). As the project design has changed, these areas would no longer be impacted and would not be subject to monitoring. As archaeological monitoring of mechanically excavated monopoles is not effective in recovering useful archaeological data, no archaeological monitoring of the installation of monopoles is necessary. Archaeological work under the PA or other agreement document is recommended.

In order to satisfy the FTA's Section 106 responsibilities, a draft PA has been developed between the NJHPO, NJ TRANSIT, FTA and the ACHP (should the ACHP decide to participate) to provide for the identification, evaluation, and appropriate treatment of historic properties (see Draft Programmatic Agreement). Stipulations include the following: documentation of historic architectural resources to the standards of the Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) as prescribed by the National Park Service, a corridor study of the segment of the Old Main DL&W Railroad Historic District within the project area (from Substation No. 41 to Hoboken Yard), an historic interpretive exhibit, archaeological monitoring, Phase II archaeological investigations, assessment of

effects, mitigation, curation, and reporting. The stipulations within the draft PA outline in detail all the potential actions necessary to carry out the requirements of the Section 106 process as project plans develop and are finalized.

As described above, due to the cumulative visual impact of the proposed monopoles, the proposed undertaking will have an adverse effect on the NRHP-eligible Old Main DL&W Railroad Historic District, the NRHP-eligible Old and New Bergen Tunnels, the NRHP-eligible West End Through Truss Bridges, the NRHP-eligible West End Interlocking Tower, the NRHP-eligible Hackensack River Lift Bridges Historic District, the NRHP-eligible Lower Hack Draw Bridge, and the NRHP-eligible DL&W Railroad Boonton Line Historic District. HAER documentation of the segment of the Old Main DL&W Railroad Historic District between the western terminus (Amtrak's Substation No. 41 in Cedar Creek Marsh South) of the project and the western portal of the Old and New Bergen Tunnels, the NRHP-eligible West End Through Truss Bridges, the NRHP-eligible West End Interlocking Tower, and the segment of the NRHP-eligible DL&W Railroad Boonton Line Historic District within the project's APE would be undertaken to mitigate, in part, the identified project-related adverse effects. In addition, NJ TRANSIT would undertake a comprehensive corridor study of the Old Main DL&W Railroad Historic District segment within the project area (from Substation No. 41 to Hoboken Terminal). The corridor study would include surveys of those resources associated with the historic rail corridor which have not been previously considered in earlier studies. Previous studies included resources such as stations and bridges. The resources to be included in the corridor study include, but are not limited to, signal houses, historic catenaries, tunnels, viaducts, rail yards, engine houses, shop buildings, turntables, substations and interlocking towers. In addition, NJ TRANSIT will design and install a multi-component historic interpretive display at an appropriate location at one of its facilities in the vicinity of the proposed Project. The display will be a designated historic interpretive installation that consists of between six and eight panels or cast plaques either set into the pavement within appropriate landscape surrounds, attached to an existing building or structure or mounted on one or more kiosks or similar structures. The interpretive exhibit will comprehensively address the history of rail transportation within the New Jersey Meadowlands.

As project plans are refined, coordination with the NJHPO would continue, as stipulated in the PA. Specifically, coordination regarding the localized effects of the preferred design option for electrical line installation (combination of monopoles, underground duct banks and attachment to existing infrastructure) would continue. As previously discussed, there are various site-specific factors, such as access, site constraints, localized geology, areas of known contamination and documentation/survey of existing utilities (both overhead and underground) that would determine the installation method of electrical lines at the specific locations. The Project is being designed to reduce impacts to existing utilities, including interruptions to public utilities or public transportation. If it is determined that the proposed Project would adversely affect additional historic resources in the APE-above ground, NJ TRANSIT, FTA, and the NJHPO would amend the PA as necessary to address those effects.