16. Floodplains

16.1. Chapter Overview

16.1.1. Introduction

The flowing chapter identifies floodplains found within the Northern Branch Corridor in accordance with Executive Order 11988, Floodplain Management. This federal legislation recognizes floodplains as having “unique and significant public values” and requires measures to minimize, restore and preserve natural floodplain values. In addition, this chapter also describes the potential for significant adverse impacts to floodplain areas as a result of the Build Alternatives.

16.1.2. Summary of Findings

The Northern Branch right-of-way is situated in a densely developed urban corridor that has been previously disturbed. Proposed station sites that would be constructed within floodplains include 91st Street Station, the western portion of Palisades Park Station and Leonia Station (Refer to Table 16-1). The North Bergen Vehicle Base Facility (VBF) is also situated within the 100-year flood zone. Adjacent right-of-way to these facilities and sections along the alignment are within known floodplains. All of the proposed station sites and VBF identified above are located south of Englewood Route 4. Accordingly, these facilities are common to both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4.

Table 16-1: Proximity of Stations/VBF to Regulated Floodplains

<table>
<thead>
<tr>
<th>Station</th>
<th>Proximity to Regulated Floodplain</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Bergen Junction VBF</td>
<td>Within 100-year floodplain (Cromakill Creek)</td>
</tr>
<tr>
<td>91st Street</td>
<td>Within 100-year floodplain (Bellmans Creek)</td>
</tr>
<tr>
<td>Ridgefield</td>
<td>Outside of 500-year floodplain</td>
</tr>
<tr>
<td>Palisades Park</td>
<td>Portion within 100-year floodplain (Overpeck Creek)</td>
</tr>
<tr>
<td>Leonia</td>
<td>Within 100-year floodplain (Overpeck Creek)</td>
</tr>
<tr>
<td>Englewood Route 4 and VBF Option at</td>
<td>Adjacent to 100-year floodplain</td>
</tr>
<tr>
<td>Englewood</td>
<td></td>
</tr>
<tr>
<td>Englewood Town Center</td>
<td>Not within 100- or 500-year floodplain</td>
</tr>
<tr>
<td>Englewood Hospital</td>
<td>Not within 100- or 500-year floodplain</td>
</tr>
<tr>
<td>Tenafly Town Center</td>
<td>Not within 100- or 500-year floodplain</td>
</tr>
<tr>
<td>Tenafly North</td>
<td>Not within 100- or 500-year floodplain</td>
</tr>
</tbody>
</table>


The improvements at these stations and along the railroad alignment which fall within the 100-year flood zone will be required to obtain a NJ Department of Environmental Protection (NJDEP) Stream Encroachment Permit. In addition, project improvements occurring within designated floodplains would be implemented in accordance with applicable regulations including those identified under the New Jersey Flood Hazard Control Act.

16.2. Methodology

The methodology of this assessment involved a review of floodplain areas within the Northern Branch study area in compliance with Executive Order 11988, Floodplain Management. Existing Federal Emergency Management Agency (FEMA) National Flood Insurance Program Q3 Flood Geographic Information Systems Data, Flood Insurance Rate Maps (FIRM) and Bergen County flood studies were...
utilized to identify the boundaries of the 100-year and 500-year floodplains along streams that cross through the project right-of-way. Applicable regulatory requirements are noted below.

16.2.1. Regulatory Requirements

16.2.1.1. Executive Order 11988, Floodplain Management

Executive Order 11988, Floodplain Management, is applicable to any federal activity which involves acquisition by purchase or lease or disposal of federal lands and public buildings; renovations or building additions; financing or assisting in construction activities; or conducting federal activities and programs affecting land use. This federal legislation recognizes floodplains as having “unique and significant public values” and requires measures to minimize, restore and preserve natural floodplain values.

16.2.1.2. Flood Hazard Area Control Act

A Flood Hazard Area permit is required by the NJDEP for activities that occur within the flood hazard area of a stream, in accordance with the Flood Hazard Area Control Act (FHACA) (N.J.S.A. 58: 16A-50 et. seq.). The general purpose of this legislation is to control development within floodplains for the purpose of minimizing potential on- and off-site damage to public and private property and to avoid or mitigate the detrimental effects of development upon the environment and the safety, health, and general welfare of the people of the State. Therefore, construction, installation or alteration of any structure, or the placement of fill along, in, or across the channel of a floodplain requires a Flood Hazard Area permit from the NJDEP.

Impacts to water quality and Riparian Zones resulting from the proposed project will be addressed as part of the Flood Hazard Area Permit Application. Refer to Chapter 14: Water Quality for details pertaining to permit requirements and mitigation measures for protection of water quality and Riparian Zones.

In November 2007, the NJDEP implemented more stringent rules (N.J.A.C. 7:13) than previously existed for flood hazard areas in the state, requiring zero percent net fill in all non-tidal flood hazard areas. The zero percent net fill provision requires that a maximum of 20 percent of the existing floodplain storage on a site may be displaced by the project provided flood storage compensation is provided off-site to meet the zero percent net fill requirement. All flood storage compensation must be made in the same flood hazard area and watershed as the proposed fill and cannot be separated from the proposed fill by a water control structure such as a road or dam. The rules provide for an exemption for the Flood Storage Displacement (a.k.a. zero percent net fill rule) for rail projects as long as justification is provided.

Although rail projects may be granted an exemption from the zero percent net fill provision, the project will be designed with the intent to meet this rule by not filling more than 20 percent of the existing floodplain storage on a site. The design for each facility will aim for less-than-significant environmental off-site consequences. If achieving this goal is not possible given site constraints, the project would apply for an exemption.

16.3. Environmental Review

The following section describes the environmental review for regulated floodplains within the Northern Branch Corridor (see Figure 16-1). As floodplain issues are typically regional in scope, existing conditions, potential impacts and mitigation methods for this environmental analysis area are addressed at the municipal level, not the project element level. As such, the following discussion will address the location of known floodplains within each corridor municipality and describe the effect of project elements within the identified floodplains.
STUDY AREA
FLOODPLAINS

Northern Branch Corridor
Figure 16-1

Source: Field Inspection
16.3.1. North Bergen

16.3.1.1. Existing Conditions

The area encompassing the proposed North Bergen VBF and its adjacent right-of-way is located within the 100-year floodplain of Cromakill Creek. The proposed 91st Station and right-of-way adjacent to the site are located within the 100-year floodplain of Bellmans Creek. Right-of-way along portions of the proposed 69th Street to 83rd Street Viaduct is also located within or adjacent to the 100-year floodplain.

16.3.1.2. Potential Impacts and Mitigation

No Build Alternative
Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed project due to overall growth and natural ecological processes within the corridor.

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4
There is no notable difference between the two Build Alternatives as they relate to floodplains in North Bergen. As a result, the following narrative applies to both alternatives.

Impacts – The project improvements for these facilities and along the railroad alignment which fall within known flood zones will be required to conform to the NJDEP FHACA and to obtain a NJDEP Flood Hazard Area Permit. New structures and utilities at these sites will be designed, connected and anchored to resist impact from debris, flotation, collapse or permanent lateral movement caused by expected structural loads and stresses (including hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation, and the freeze thaw cycle of the soil.

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 will require the installation of overhead electric catenary along the alignment. The catenary poles will be properly anchored to withstand the structural loads as well as both hydrostatic and hydrodynamic stresses from flooding equal to the regulatory flood elevation.

Any proposed retaining walls within the 100-year floodplain will be supplemented with a stability analysis if it extends four feet or more above the watercourse bed or ground elevation at the base of the wall. Foundations will be properly anchored to withstand the structural loads and stresses (both hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation. The proposed viaduct in North Bergen will be designed so as not to increase the upstream water surface elevation by more than two-tenths of a foot during the regulatory flood.

The natural floodplain characteristics (i.e. surface water floodway and flood storage capacity) of the corridor would not be affected by the implementation of either Build Alternative since the right-of-way, station platforms, parking facilities, and VBF facility would be located primarily in densely developed urban areas. No adverse impacts to floodplains are anticipated as project-related site improvements would be implemented in conformance with FHACA standards.
Mitigation – Mitigation measures would include using structures to cross floodplains instead of filling them, providing adequate flow circulation, reducing grading requirements and preserving natural drainage when possible. During Final Engineering and Design, the project will be designed with the intent to meet the zero net fill rule by not filling more than 20 percent of the existing floodplain storage on a site and for providing off-site storage areas within the same flood hazard area and watershed. All fill will be placed so as not to adversely affect overland drainage flow and shall be compacted and stabilized in accordance with the “Standards for Soil Erosion and Sediment Control in New Jersey.” Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention. If achieving this 20 percent goal is not possible given site constraints, the project would apply for an exemption.

16.3.2. Fairview

16.3.2.1. Existing Conditions

In Fairview, the alignment crosses two navigable waterways, Bellmans Creek and Wolf Creek. These waterways, both major tributaries of the Hackensack River, are located south of Ridgefield Station. The sections of rail right-of-way that cross these waterways are located within the 100-year floodplain.

16.3.2.2. Potential Impacts and Mitigation

No Build Alternative
Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed action due to overall growth and natural ecological processes within the corridor.

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4
There is no notable difference between the two Build Alternatives as they relate to floodplains in Fairview. As a result, the following narrative applies to both alternatives.

Impacts – The proposed re-construction of the existing bridges over Bellmans Creek and Wolf Creek in Fairview will involve widening, excavation, and the placement of materials in and around the structure over the waterways. The project improvements for these structures and along the railroad alignment which fall within known flood zones will be required to conform to the NJDEP FHACA and to obtain a NJDEP Flood Hazard Area Permit. New structures and utilities at these sites will be designed, connected and anchored to resist impact from debris, flotation, collapse or permanent lateral movement caused by expected structural loads and stresses (including hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation, and the freeze thaw cycle of the soil. The proposed bridges along the alignment that span the floodplain will be designed so as not to increase the upstream water surface elevation by more than two-tenths of a foot during the regulatory flood.

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 will require the installation of overhead electric catenary along the alignment. The catenary poles will be properly anchored to withstand the structural loads as well as both hydrostatic and hydrodynamic stresses from flooding equal to the regulatory flood elevation.
Any proposed retaining walls within the 100-year floodplain will be supplemented with a stability analysis if it extends four feet or more above the watercourse bed or ground elevation at the base of the wall. Foundations will be properly anchored to withstand the structural loads and stresses (both hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation.

The natural floodplain characteristics (i.e. surface water floodway and flood storage capacity) of the corridor would not be affected by the implementation of either Build Alternative since the proposed improvements would be located primarily in densely developed urban areas. No adverse impacts to floodplains are anticipated as project-related site improvements would be implemented in conformance with FHACA standards.

Mitigation – Mitigation measures would include using structures to cross floodplains instead of filling them, providing adequate flow circulation, reducing grading requirements and preserving natural drainage when possible. During Final Engineering and Design, the project will be designed with the intent to meet the zero net fill rule by not filling more than 20 percent of the existing floodplain storage on a site and for providing off-site storage areas within the same flood hazard area and watershed. All fill will be placed so as not to adversely affect overland drainage flow and shall be compacted and stabilized in accordance with the “Standards for Soil Erosion and Sediment Control in New Jersey.” Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention. If achieving this 20 percent goal is not possible given site constraints, the project would apply for an exemption.

16.3.3. Ridgefield

16.3.3.1. Existing Conditions

The area encompassing the proposed Ridgefield Station and its adjacent right-of-way is located outside of the 500-year floodplain. Portions of the rail alignment through the municipality are located within the 100-year flood zone.

16.3.3.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed action due to overall growth and natural ecological processes within the corridor.

Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

There is no notable difference between the two Build Alternatives as they relate to floodplains in Ridgefield. As a result, the following narrative applies to both alternatives.

Impacts –Project improvements associated with the proposed Ridgefield Station and its adjacent right-of-way would not result in significant adverse impacts to floodplains since the proposed station area is not situated within the 500-year floodplain zone. The project improvements along the railroad alignment which fall within known flood zones will be required to conform with the NJDEP FHACA and to obtain a NJDEP Flood Hazard Area Permit. New structures and utilities at these sites will be designed, connected
and anchored to resist impact from debris, flotation, collapse or permanent lateral movement caused by expected structural loads and stresses (including hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation, and the freeze thaw cycle of the soil.

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 will require the installation of overhead electric catenary along the alignment. The catenary poles will be properly anchored to withstand the structural loads as well as both hydrostatic and hydrodynamic stresses from flooding equal to the regulatory flood elevation. Any proposed retaining walls placed along the right-of-way within the municipality within a designated floodplain, will be supplemented with a stability analysis if it extends four feet or more above the watercourse bed or ground elevation at the base of the wall. Any additional project components including foundations will be properly anchored in a similar manner to the catenary poles described above.

The natural floodplain characteristics (i.e. surface water floodway and flood storage capacity) of the corridor would not be affected by the implementation of either Build Alternative since the proposed station area would be located outside of the designated floodplain and is situated in a densely developed urban area. No adverse impacts to floodplains are anticipated.

Mitigation – Mitigation measures would include using structures to cross floodplains instead of filling them, providing adequate flow circulation, reducing grading requirements and preserving natural drainage when possible. During Final Engineering and Design, the project will be designed with the intent to meet the zero net fill rule by not filling more than 20 percent of the existing floodplain storage on a site and for providing off-site storage areas within the same flood hazard area and watershed. All fill will be placed so as not to adversely affect overland drainage flow and shall be compacted and stabilized in accordance with the “Standards for Soil Erosion and Sediment Control in New Jersey”. Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention. If achieving this 20 percent goal is not possible given site constraints, the project would apply for an exemption.

16.3.4. Palisades Park

16.3.4.1. Existing Conditions

The area encompassing the western portion of the proposed Palisades Park Station is adjacent right-of-way, and sections of alignment through the municipality are located within the 100-year floodplain of Overpeck Creek.

16.3.4.2. Potential Impacts and Mitigation

No Build Alternative
Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed action due to overall growth and natural ecological processes within the corridor.
Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4

There is no notable difference between the two Build Alternatives as they relate to floodplains in Palisades Park. As a result, the following narrative applies to both alternatives.

**Impacts** – The western portion of the Palisades Park Station and sections of the rail right-of-way through the municipality are within the 100-year floodplain of Overpeck Creek. The project improvements at this proposed facility and along the railroad alignment which fall within known flood zones will be required to conform with the NJDEP FHACA and to obtain a NJDEP Flood Hazard Area Permit. New structures and utilities at these sites will be designed, connected and anchored to resist impact from debris, flotation, collapse or permanent lateral movement caused by expected structural loads and stresses (including hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation, and the freeze thaw cycle of the soil.

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 will require the installation of overhead electric catenary along the alignment. The catenary poles will be properly anchored to withstand the structural loads as well as both hydrostatic and hydrodynamic stresses from flooding equal to the regulatory flood elevation.

Any proposed retaining walls within the 100-year floodplain will be supplemented with a stability analysis if it extends four feet or more above the watercourse bed or ground elevation at the base of the wall. Foundations will be properly anchored to withstand the structural loads and stresses (both hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation.

The natural floodplain characteristics (i.e. surface water floodway and flood storage capacity) of the corridor would not be affected by the implementation of either Build Alternative since the right-of-way, station platforms, and parking facilities would be located primarily in densely developed urban areas. No adverse impacts to floodplains are anticipated as project-related site improvements would be implemented in accordance with FHACA standards.

**Mitigation** – Mitigation measures would include using structures to cross floodplains instead of filling them, providing adequate flow circulation, reducing grading requirements and preserving natural drainage when possible. During Final Engineering and Design, the project will be designed with the intent to meet the zero net fill rule by not filling more than 20 percent of the existing floodplain storage on a site and for providing off-site storage areas within the same flood hazard area and watershed. All fill will be placed so as not to adversely affect overland drainage flow and shall be compacted and stabilized in accordance with the “Standards for Soil Erosion and Sediment Control in New Jersey.” Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention. If achieving this 20 percent goal is not possible given site constraints, the project would apply for an exemption.

16.3.5. Leonia

16.3.5.1. Existing Conditions

The area encompassing the proposed Leonia Station, its adjacent right-of-way, and sections of the alignment through the municipality is located within the 100-year floodplain of Overpeck Creek.
16.3.5.2 Potential Impacts and Mitigation

**No Build Alternative**
Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed action due to overall growth and natural ecological processes within the corridor.

**Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4**
There is no notable difference between the two Build Alternatives as they relate to floodplains in Leonia. As a result, the following narrative applies to both alternatives.

**Impacts** – The proposed Leonia Station and adjacent right-of-way are located within the 100-year floodplain of Overpeck Creek. The project improvements at this proposed facility and along the railroad alignment which fall within known flood zones will be required to conform to the NJDEP FHACA and to obtain a NJDEP Flood Hazard Area Permit. New structures and utilities at these sites will be designed, connected and anchored to resist impact from debris, flotation, collapse or permanent lateral movement caused by expected structural loads and stresses (including hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation, and the freeze thaw cycle of the soil.

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 will require the installation of overhead electric catenary along the alignment. The catenary poles will be properly anchored to withstand the structural loads as well as both hydrostatic and hydrodynamic stresses from flooding equal to the regulatory flood elevation.

Any proposed retaining walls within the 100-year floodplain will be supplemented with a stability analysis if it extends four feet or more above the watercourse bed or ground elevation at the base of the wall. Foundations will be properly anchored to withstand the structural loads and stresses (both hydrostatic and hydrodynamic) from flooding equal to the regulatory flood elevation.

The natural floodplain characteristics (i.e. surface water floodway and flood storage capacity) of the corridor would not be affected by the implementation of either Build Alternative since the right-of-way, station platforms, and parking facilities would be located primarily in densely developed urban areas. No adverse impacts to floodplains are anticipated as project-related site improvements would be implemented in conformance with FHACA standards.

**Mitigation** – Mitigation measures would include using structures to cross floodplains instead of filling them, providing adequate flow circulation, reducing grading requirements and preserving natural drainage when possible. During Final Engineering and Design, the project will be designed with the intent to meet the zero net fill rule by not filling more than 20 percent of the existing floodplain storage on a site and for providing off-site storage areas within the same flood hazard area and watershed. All fill will be placed so as not to adversely affect overland drainage flow and shall be compacted and stabilized in accordance with the “Standards for Soil Erosion and Sediment Control in New Jersey.” Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention. If achieving this 20 percent goal is not possible given site constraints, the project would apply for an exemption.
16.3.6. Englewood

16.3.6.1. Existing Conditions

The proposed Englewood Route 4 Station and optional VBF site are located outside of but adjacent to the 100-year floodplain zone. Areas north of Englewood Route 4 Station, including the proposed station sites for Englewood Town Center and Englewood Hospital are not located within the 100-year or 500-year floodplain zones.

16.3.6.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed action due to overall growth and natural ecological processes within the corridor.

Light Rail to Tenafly (Preferred Alternative)

Impacts – The proposed Englewood Route 4 Station and proposed optional VBF site are located adjacent to but not within the designated 100-year floodplain zone. The two other proposed station areas in Englewood, Englewood Town Center and Englewood Hospital, are not in designated flood zones. Therefore, the proposed project would not result in significant adverse impacts to floodplains in Englewood.

Mitigation – None is required.

Light Rail to Englewood Route 4

Impacts – The implementation of this alternative, which terminates at the proposed Englewood Route 4 Station, would be similar to Light Rail to Tenafly (Preferred Alternative). The proposed Englewood Route 4 Station and proposed optional VBF site are located adjacent to but not within the designated 100-year floodplain zone; therefore, the proposed project would not result in significant adverse impacts to floodplains in Englewood. No impacts to Englewood Town Center Station or Englewood Hospital Station would result as these station sites would not be developed under the Light Rail to Englewood Route 4 Alternative.

Mitigation – None is required.

16.3.7. Tenafly

16.3.7.1. Existing Conditions

The proposed station sites for Tenafly Town Center and Tenafly North are not situated within the 100-year floodplain or 500-year floodplain.
16.3.7.2. Potential Impacts and Mitigation

No Build Alternative
Under the No Build Alternative, passenger rail service along the Northern Branch right-of-way would not be implemented as the proposed project would not be constructed. CSX freight service would continue within the Northern Branch Corridor without operational changes or improvements.

Any approved developments located within the 100-year floodplain would be required to comply with FEMA regulations and NJDEP FHACA standards. A NJDEP Flood Hazard Area Permit would be required for developments located within the 100-year flood zone that are subject to fluvial flooding. It is probable that flood zone boundaries will change in the absence of the proposed action due to overall growth and natural ecological processes within the corridor.

Light Rail to Tenafly (Preferred Alternative)
Impacts – The proposed station locations within the municipality are situated outside of designated floodplain zones. As such, this alternative would not result in significant adverse impacts to floodplains in Tenafly.

Mitigation – None is required.

Light Rail to Englewood Route 4
Impacts - The Light Rail to Englewood Route 4 Alternative terminates at Englewood Route 4 Station and does not involve construction of Tenafly Town Center Station or Tenafly North Station. Impacts to floodplains in Tenafly would not result.

Mitigation – None is required.

16.4. Summary of Potential Environmental Effects
A substantial portion of the right-of-way and the areas west of the right-of-way, as well as some areas east of the right-of-way, are within the 100-year and 500-year floodplain of nearby waterways including Overpeck Creek, Bellmans Creek and Cromakill Creek. There is no difference between the two Build Alternatives under consideration, Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4, in terms of their potential to impact floodplains. The same floodplains would be crossed by the rail alignment in the section of the proposed project common to both which extends between North Bergen and the proposed Englewood Route 4 Station. As areas north of Englewood Route 4 Station are not within known floodplains, there is no distinction between the Build Alternatives. Table 16-2 summarizes the areas of potential floodplain impact resulting from the proposed project. Floodplain impacts are indicated by the areas of construction within known floodplains and include the need for additional construction measures for project elements within floodplains to withstand the force of flooding should it occur.
Table 16-2: Summary of Potential Floodplain Impacts by Build Alternative

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Affected Stations and Adjacent Rail Right-of-Way</th>
<th>Affected Yard or other Structural Elements</th>
<th>Other Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Rail to Tenafly (Preferred Alternative)</td>
<td>91st Street Station, western portion of Palisades Park Station, Leonia Station</td>
<td>North Bergen VBF and 69th to 83rd Street Viaduct</td>
<td>Catenary reinforcement in floodplains</td>
</tr>
<tr>
<td>Light Rail to Englewood Route 4</td>
<td>91st Street Station, western portion of Palisades Park Station, Leonia Station</td>
<td>North Bergen VBF and 69th to 83rd Street Viaduct</td>
<td>Catenary reinforcement in floodplains</td>
</tr>
</tbody>
</table>

Executive Order 11988 requires measures to minimize, restore and preserve natural floodplain values. Measures would include using structures to cross floodplains instead of filling them, providing adequate flow circulation, reducing grading requirements and preserving natural drainage when possible.

Mitigation for impacts to floodplain areas would require a New Jersey Department of Environmental Protection Flood Hazard Area permit issued from the Land Use Regulation Program under the Flood Hazard Area Control Act, N.J.S.A. 58:16A. The Flood Hazard Area permit may be applied for in conjunction with an Individual Freshwater Wetlands Fill Permit, which is discussed in Chapter 15: Wetlands.

Although rail projects may be granted an exemption from the zero percent net fill provision, the project will be designed with the intent to meet this rule by not filling more than 20 percent of the existing floodplain storage on a site. As compensation, flood storage areas would be provided off-site within the same flood hazard area and watershed as the proposed fill and will not be separated from the proposed fill by a water control structure such as a road or dam. Excess runoff associated with the project will be mitigated through the use of wet ponds, storm water infiltration or detention facilities and bio-retention best management practices as outlined by the NJDEP Land Use Regulation Program. The design for each facility will aim for less-than-significant environmental off site consequences. If achieving this goal is not possible given site constraints, the project would apply for an exemption.

Pre-application meetings will be initiated with NJDEP during final engineering. These meetings will establish specific mitigation requirements and help avoid any extensive design setbacks during the permitting process.