

14. Water Quality

14.1. Chapter Overview

14.1.1. Introduction

This section describes activities associated with the development and operation of the Northern Branch project that may affect water quality within the study area. The analysis is conducted relative to the State and Federal regulations intended to maintain and promote surface and groundwater quality.

14.1.2. Summary of Findings

The study area is crossed by five identified water bodies contributing to the surface hydrology of the region. Table 14-1 lists these water bodies. There are multiple crossings of many of the waterbodies, all of which flow into the Hackensack River, which feeds the New Jersey Meadowlands. There are no sole source aquifers in the study area.

Table 14-1: Waterbody Crossings

Stream Name	Classification*	Number of Crossings	
		Light Rail to Tenafly (Preferred Alternative)	Light Rail to Englewood Route 4
Bellmans Creek	C2 - FW2-NT	2	2
Wolf Creek	C2 - FW2-NT	1	1
Overpeck Creek and tributaries	C2 - FW2-NT	5	5
Flat Rock Brook	C2-FW2-NT-SE2	1	0
Tenakill Brook	C1 - FW2-NT	1	0
TOTAL		10	8

* C1-Category 1; C2-Category 2; FW2-Freshwater 2; NT-Non-Trout Producing; SE2-Saline Estuarine.

Source: NJDEP Surface Water Quality Standards (N.J.A.C. 7:9B).

The improvements proposed for the Northern Branch project will have no adverse impact on water quality provided that appropriate mitigation measures and best management practices (BMPs) are followed during both the construction and operation of the project, specifically:

- Improvements to the rail right-of-way will result in construction activity at existing rail crossings of the streams. In most instances, the work required involves minor rehabilitation of existing crossings, but in some areas, the work required involves the construction of a second track where presently there is only one.
 - Sheet piling and small cofferdams may be used in circumstances where construction activity must occur within the waterbody itself, typically in association with the installation of new support structures for bridges.
- Only the Tenakill Brook is a C-1 waterway; no improvements are proposed at the crossing of the Tenakill Brook.
- During the operation of rail service, NJ TRANSIT's inspection and maintenance program will mitigate potential non-point source pollution from rail vehicles traveling on the right-of-way.
- All station sites for both Build Alternatives will be constructed on predominantly existing impervious land. Station parking facilities will require stormwater management facilities, including bio-retention systems, stormwater infiltration systems, sand filters, and other measures intended to return the overland flow of stormwater to pre-construction rates and remove pollutants from the stormwater.

- The vehicle base facility (VBF) will include separate systems for handling stormwater runoff and wastewater from maintenance activities.

14.2. Methodology

14.2.1. Regulatory Framework

Pursuant to the 1994 Memorandum of Agreement (MOA) between the State of New Jersey and the U.S. Army Corps of Engineers (USACE), with few exceptions, the N.J. Department of Environmental Protection (NJDEP) has assumed jurisdiction over all waters regulated by Section 404 of the Clean Water Act. This agreement grants NJDEP authority over improvement projects that, in other states, are regulated by the USACE. NJDEP has enacted the following regulations to maintain and promote surface and groundwater quality:

- Surface Water Quality Standards were established by the NJDEP pursuant to N.J.A.C. 7:9B. These standards were developed to protect and enhance surface water resources and to provide criteria for classification of each water's intended level of protection. The Category 1 (C1) designation is the highest level of anti-degradation protection a surface waterbody can receive. Surface waters receiving a C1 designation are either exceptional ecological resources, water supplies, of recreational significance, threatened or endangered species habitat, an exceptional shellfish resource, or an exceptional fisheries resource. Table 14-2 identifies NJDEP's water resource categories.

Table 14-2: NJDEP Water Resource Categories

Resource ID	Resource Category	Description
FW1	Freshwater 1	Waters that are to be maintained in their natural state of exceptional quality (set aside for posterity) and not to be subjected to waste water discharges.
FW2	Freshwater 2	Those waters that are not classified as Freshwater 1 or Pinelands Waters.
TM	Trout Maintenance	Waters that are stocked or support trout throughout the year.
NT	Non-Trout Producing	Waters not designated as Trout Producing or Trout Maintenance waters.
SE2	Saline Estuarine	Waters connected to saline waters of estuaries
C1	Category 1	Receive protection from measurable changes in water quality due to their clarity, color, scenic setting, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources.
C2	Category 2	All waters that are not designated as Category 1 or as Outstanding National Resource Waters.

Source: NJDEP Surface Water Quality Standards (N.J.A.C. 7:9B).

- Stormwater Management rules (N.J.A.C. 7:8) grant Special Water Resource Protection Areas (SWRPA) for C1 waters, which require a 300-foot buffer from the top of the existing bank. Development in the SWRPA is permitted for limited circumstances, which include linear developments, only if the value and function of the SWRPA is maintained or improved. The rules also mandate that 100 percent of the increased stormwater runoff associated with new developments be absorbed into the soil. A waiver for strict compliance with the stormwater management rules may be obtained for the enlargement of existing railroads or roadways.
- The Flood Hazard Area Control Act (FHACA) rules (N.J.A.C. 7:7) contain provisions that establish Riparian Zones within which disturbances are regulated. Riparian Zones apply to streams with a definable bed and bank and are intended to protect the vegetation adjacent to streams and other waterbodies. Riparian Zones may extend 300 feet for streams designated as C1, 150 feet for streams

where acid soils exist or those that support trout or threatened and endangered species, and 50 feet for all other streams. According to the FHACA, disturbance within the Riparian Zone must be minimized, justified, and mitigated for excess disturbance exceeding the allowable limits. Allowable limits for a reconstructed railroad crossing a stream are 15,000 square feet for a 300-foot zone, 7,500 square feet for a 150-foot zone, and 2,500 square feet for a 50-foot zone, basically a width of 50 feet times the length of the zone.

14.2.2. Identification of Surface and Groundwater Resources

Water resources in the Northern Branch study area were identified first through a search of NJDEP's State Water Quality Standard data, which lists all waterbodies regulated by NJDEP. Groundwater resources were identified through a review of soil and geological data, including the County Soil Surveys for Bergen County and Hudson County. No sole source aquifers were identified in the study area. Sole source aquifers are a groundwater source that supplies at least 50 percent of the drinking water for an overlying area. While the study area does not contain a potable sole-source aquifer, groundwater in the study area helps feed surface streams that flow into area waterways.

Surface water resource findings were verified through aerial photography and field investigation. Field investigation was particularly important in identifying areas where proposed project improvements interact with surface water resources.

The resources listed in the following environmental review are complete insofar as existing documentation and field reconnaissance could identify. The potential exists, however, for NJDEP to classify swales adjacent to the alignment as tributaries with definable bed and bank. This determination would be made prior to Final Design and Engineering and is not available at this stage of the environmental review. Should NJDEP make this finding, the Riparian Zone rules would apply to the swales, and NJ TRANSIT would work with NJDEP to minimize impacts and develop mitigation where required.

14.2.3. Mitigation Measures

Mitigation measures are largely established by the regulatory and permitting agencies, and expressed in terms of regulatory requirements and best management practices (BMPs). BMPs include both techniques and technologies developed by the regulatory agencies with the intent of offering sound guidelines for managing environmental resources. BMPs are often context-sensitive as there are separate BMPs for surface water treatment and construction work that must occur within existing surface water bodies. BMPs also address different phases of a project, such as construction erosion control and long-term maintenance BMPs. The majority of BMPs discussed below are derived from the *New Jersey Stormwater Best Management Practices Manual*.

At the DEIS phase, mitigation measures are not site-specific for water quality; rather, mitigation measures and BMPs address specific scenarios that are common to the three major project elements: rail right-of-way, VBF, and station sites. As the mitigation measures do not differ between station sites or right-of-way improvements, the mitigation and BMPs are discussed below and referenced in the municipal discussions in the following environmental review section (Section 14.3 – Environmental Review).

14.2.3.1. Construction Phase Mitigation Measures and BMPs

Rail Right-of-Way Mitigation and BMPs for Construction

BMPs intended to minimize the potential for degradation in water quality associated with rail right-of-way improvements may include the construction of cofferdams and/or sheet piling to contain fill materials and to prevent excavated soils from entering the water column if necessary. Cofferdams, if required for

Northern Branch improvements will be small in size and used for a short period of time, effectively reducing the potential for undesirable impacts on the biological communities or flow of the affected waterbody.

Station Site and Vehicle Base Facility Mitigation and BMPs for Construction

During construction activities, a number of techniques may be used to prevent siltation of area waterways and preserve habitat for aquatic species. These methods include, but are not limited to:

- Stabilization of slopes, channels, swales and embankments after construction activities are completed;
- Excavation activities would be conducted to minimize the amount of land disturbance;
- Installation of turbidity barriers around the area of construction to confine turbidity to a limited area and not discourage the upstream or downstream passage of migratory or other fish species;
- Phasing construction of project elements located within surface waters so at all times a portion of the watercourse not less than one-third its total size will be left unobstructed; and,
- Prohibiting construction within waterways during anadromous fish spawning/migration activities.

In the event that groundwater is encountered during construction of the retaining walls, pedestrian bridges, platforms, and foundations, it will be pumped from the excavations, filtered and discharged to the stormwater discharge system or to on-site infiltration ditches. Such dewatering would be temporary and limited to the time required for excavation and construction. Dewatering permits would be obtained from the NJDEP, as required.

14.2.3.2. Maintenance Phase Mitigation Measures and BMPs

Rail Right-of-Way Mitigation and BMPs During Revenue Service

NJ TRANSIT utilizes a thorough maintenance and inspection program for all of its transit vehicles. At a minimum, all vehicles are inspected on a daily basis to evaluate each vehicle's operating condition. The inspection includes checking brake systems, safety systems and general mechanical conditions, including leaking fluids. Should any deficient conditions be found, including leaking fluids, the vehicle is repaired or taken out of service. Additionally, the vehicles are run through a wash system on a regular schedule to clean the exteriors of the vehicles. This cleaning removes any build-up of particulates and/or fluids which may have accumulated on the vehicle during the normal course of operations. The water from the wash system is collected and treated to remove these pollutants in accordance with applicable regulations.

Any new structures (bridges/culverts) over waterways or modification of existing substructures will require evaluation for scour protection. Substructure design options and countermeasures will be selected to ensure there are minimal resultant impacts to the water column. None of the improvements summarized in the tables will result in notable alteration of streambed morphology.

Spills of herbicides will be treated as a hazardous materials event and managed consistent with the policies developed for these instances.

Station Site and Vehicle Base Facility Mitigation and BMPs During Revenue Service

Vehicle Base Facility

Runoff from the maintenance activities will be handled separately from the stormwater. Site-generated effluents will be treated on-site prior to discharge into the sewage or wastewater system. Wastewater from the vehicle wash facilities will be filtered and recycled and pollution control chambers will skim contaminants from wastewater.

Appropriate planning and coordination with permitting agencies will ensure that effluent discharge standards are met. Waste streams of any toxic or hazardous materials, such as oil and solvents, will be secured and monitored in accordance with applicable Federal and State regulations. In order to satisfy

NJDEP requirements, total suspended solids (TSS) management will occur by pass through of a mechanical means, such as oil/water separators, which is a passive structure that collects the oil and allows the water to flow into the stormwater management system. These structures are cleaned and maintained on a regular basis. Underground storage tanks will be subject to regulation under the Resource Conservation Recovery Act (RCRA), which requires conformance with standards and requirements concerning installation, spill and overflow protection, corrosion protection and leak detection.

Station Sites

Stormwater management facilities are proposed as a permanent part of the station design, and are both a project element and a mitigation measure. The possible locations for stormwater management facilities are shown on the station plans in Appendix B. The goal of the stormwater management facilities is to approximate the pre-construction run-off conditions in terms of quantity and quality. Mitigation measures, described in the *New Jersey Stormwater Best Management Practices Manual*, may include bio-retention systems, storm water infiltration systems, pervious paving systems, sand filters, and the use of vegetated swales and wet ponds. As some station locations are already built upon and/or paved, additional stormwater management may not be required. The ultimate need for a facility, and its size and location will be determined in coordination with NJDEP and will be finalized in Final Design and Engineering. Approved soil erosion and sediment control plans during construction would include the use of hay bales, silt fencing and vegetative cover.

Additional riparian area mitigation techniques would be developed in consultation with NJDEP and may include conservation easements, removal of pavement, and planting of indigenous trees.

14.3. Environmental Review

Following is a discussion of the surface waters and the potential impact within each municipality. The study area municipal boundaries were established more than 100 years ago and in many locations are based on waterways. As a result, some crossings of the rail right-of-way straddle a municipal boundary. In these instances, the crossing is discussed in each associated municipal narrative, essentially repeated, for the benefit of readers with local concerns.

14.3.1. North Bergen

14.3.1.1. Existing Conditions

North Bergen is located within the Hackensack/Pascack Watershed Management Area. Bellmans Creek, a major tributary of the Hackensack River, is found within North Bergen, and crosses the rail right-of-way in two locations, one on the border of Fairview and North Bergen and one location slightly farther south (Refer to Figure 14-1).

14.3.1.2. Potential Impacts and Mitigation

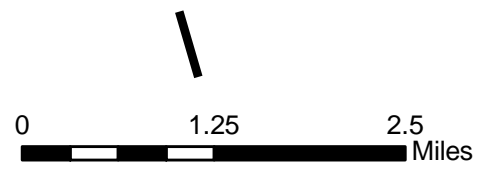
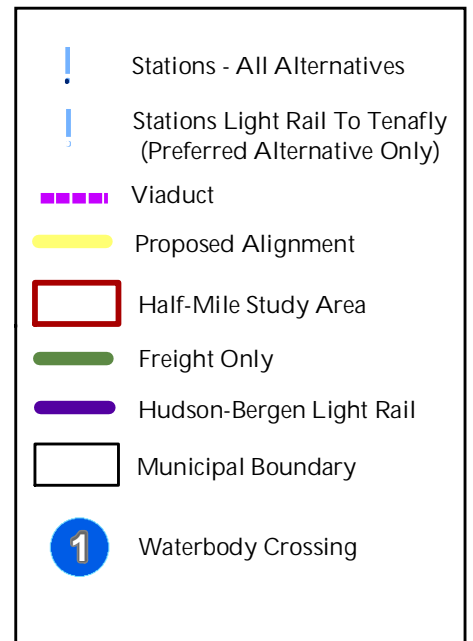
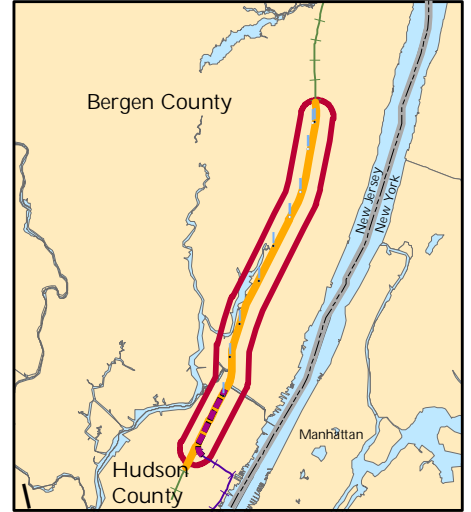
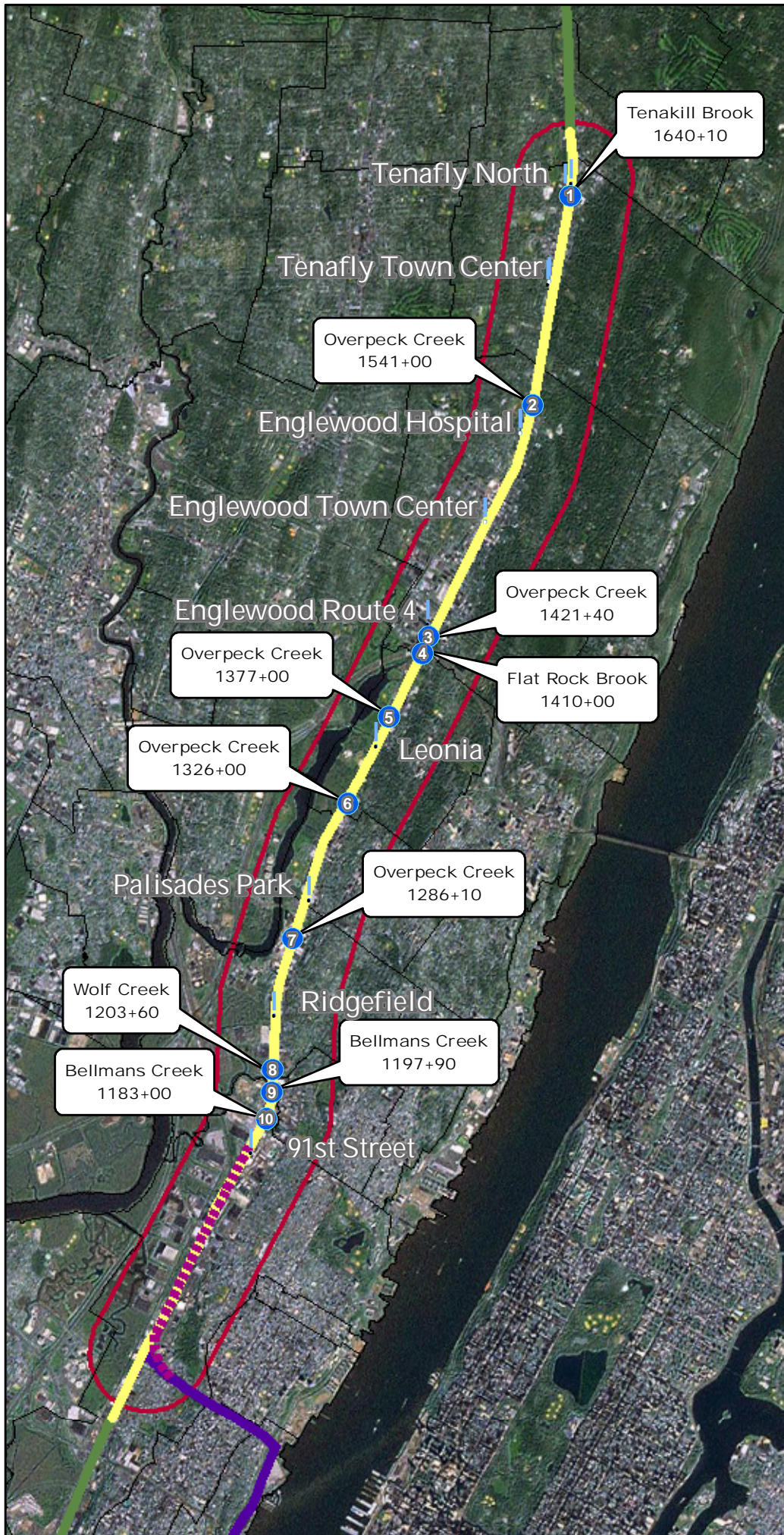
No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are automobiles.

WATERBODY CROSSINGS

Northern Branch Corridor
Figure 14-1



Source: NJDEP

Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

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

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through North Bergen. Consequently, the discussion below applies to both alternatives.

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-2 summarizes the modifications proposed for the rail right-of-way in North Bergen. Each of the stream crossings identified has an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The allowable limit for reconstructed rail construction within this 50-foot zone is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits. As a result, no impact to Riparian Zone elements is anticipated for identified stream crossings.

Table 14-2: Proposed Modifications to Waterbody Crossings in North Bergen

Map No.	Location	Station	County	Municipality	Proposed Modifications
10	Bellmans Creek	1183+00	Hudson	North Bergen	Replace culvert
9	Bellmans Creek	1197+90	Bergen	North Bergen/ Fairview	Add adjacent span

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – During in-stream construction, to prevent fill materials and excavated soils from entering the water column, sheet piling would likely be used for the first crossing of Bellmans Creek to replace the culvert, and cofferdams would likely be used for the second crossing where a new substructure is required for the adjacent span. Additionally, construction sites would be stabilized upon completion and construction timing, and disturbance will be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area.

North Bergen Vehicle Base Facility

Impacts – The proposed VBF will be constructed on already impervious or disturbed urban land. The facility would be designed to incorporate stormwater management facilities (the size and location of these

facilities will be determined during Final Design and Engineering). The proposed VBF is not within the Special Water Resource Protection Area (SWRPA) of a C1 waterway or within a Riparian Zone.

During construction, excavation activities may result in the potential for siltation of area waterways. The proposed project will not involve depletion of the water table from excessive withdrawal of groundwater; however, there is the potential that the proposed project will encounter groundwater during construction.

Activities at the VBF may generate effluent consisting of sanitary waste, oil, solvents, and other chemicals associated with vehicle maintenance. Without mitigation, spills or mishandled materials associated with vehicle maintenance could affect both groundwater and surface water. In addition, underground storage tanks may be incorporated into the station design. Leaking tanks are a potential source of groundwater contamination.

Mitigation – Stormwater management facilities are proposed to maintain preconstruction run-off conditions in terms of water quantity and quality. Further details are included in Section 14.2.3 – Mitigation Measures.

91st Street Station

Impacts – The proposed 91st Street Station will be constructed on already impervious or disturbed urban land. The parking facility would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. 91st Street Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – As this is an existing parking area, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the review agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality. The proposed site plan shown in Appendix B, Figure 4 does show a potential location for a stormwater facility. Further details are included in Section 14.2.3 – Mitigation Measures.

14.3.2. Fairview

14.3.2.1. Existing Conditions

Fairview is located within the Hackensack/Pascack Watershed Management Area. Bellmans Creek and Wolf Creek, both major tributaries of the Hackensack River, are found within Fairview. Bellmans Creek crosses the rail right-of-way on the border of Fairview and North Bergen, and Wolf Creek, which flows into Bellmans Creek crosses the right-of-way just north of the Bellmans Creek crossing, on the border of Fairview and Ridgefield (Refer to Figure 14-1).

14.3.2.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are

automobiles. Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

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

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through Fairview. Consequently, the discussion below applies to both alternatives.

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-3 summarizes the modifications proposed for the rail right-of-way in Fairview. Each of the stream crossings identified has an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The allowable limit for reconstructed rail construction within this 50-foot zone is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits; as a result, no impact to Riparian Zone elements is anticipated for identified stream crossings.

Table 14-3: Proposed Modifications to Waterbody Crossings in Fairview

Map No.	Location	Station	County	Municipality	Proposed Modifications
9	Bellmans Creek	1197+90	Bergen	North Bergen/ Fairview	Add adjacent span
8	Wolf Creek	1203+60	Bergen	Fairview/Ridgefield	Minor rehabilitation, no in-water work proposed

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – During in-stream construction, to prevent fill materials and excavated soils from entering the water column, cofferdams would likely be used for the crossing of Bellmans Creek where a new substructure is required for the adjacent span. Additionally, construction sites would be stabilized upon completion and construction timing, and disturbance will be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area. Further details are included in Section 14.2.3 – Mitigation Measures.

14.3.3. Ridgefield

14.3.3.1. Existing Conditions

Ridgefield is located within the Hackensack/Pascack Watershed Management Area. Wolf Creek, a major tributary of the Hackensack River, is found within Ridgefield, and crosses the rail right-of-way near the Fairview/Ridgefield border (Refer to Figure 14-1).

14.3.3.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are automobiles. Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

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

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through Ridgefield. Consequently, the discussion below applies to both alternatives.

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-4 summarizes the modifications proposed for the rail right-of-way in Ridgefield. The stream crossing identified has an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The allowable limit for reconstructed rail construction within this 50-foot zone is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits; as a result, no impact to Riparian Zone elements is anticipated for identified stream crossings.

Table 14-4: Proposed Modifications to Waterbody Crossings in Ridgefield

Map No.	Location	Station	County	Municipality	Proposed Modifications
8	Wolf Creek	1203+60	Bergen	Fairview/Ridgefield	Minor rehabilitation

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – Construction sites would be stabilized upon completion. Further details are included in Section 14.2.3 – Mitigation Measures.

Ridgefield Station

Impacts – The proposed Ridgefield Station will be constructed on already impervious and disturbed urban land. The parking facility would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. Ridgefield Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – As this is an existing parking area, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the review agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality. The proposed site plan shown in Appendix B, Figure 5 shows a potential location for a stormwater facility. Further details are included in Section 14.2.3 – Mitigation Measures.

14.3.4. Palisades Park

14.3.4.1. Existing Conditions

Palisades Park is located within the Hackensack/Pascack Watershed Management Area. Two tributaries to Overpeck Creek cross the rail right-of-way in Palisades Park (Refer to Figure 14-1).

14.3.4.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are automobiles. Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

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

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through Ridgefield. Consequently, the discussion below applies to both alternatives.

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-5 summarizes the modifications proposed for the rail right-of-way in Palisades Park. The stream crossings identified have an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The allowable limit for reconstructed rail construction within this 50-foot zone is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits; as a result, no impact to Riparian Zone elements is anticipated for identified stream crossings.

Table 14-5: Proposed Modifications to Waterbody Crossings in Palisades Park

Map No.	Location	Station	County	Municipality	Proposed Modifications
7	Tributary to Overpeck Creek	1286+10	Bergen	Palisades Park	Widen culvert
6	Tributary to Overpeck Creek	1326+00	Bergen	Palisades Park/Leonia	Add adjacent span

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – During in-stream construction, to prevent fill materials and excavated soils from entering the water column, sheet piling would likely be used for the first crossing of the Tributary to Overpeck Creek to widen the culvert, and cofferdams would likely be used for the second crossing where a new substructure is required for the adjacent span. Additionally, construction sites would be stabilized upon completion and construction timing, and disturbance will be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area. Further details are included in Section 14.2.3 – Mitigation Measures.

Palisades Park Station

Impacts– The proposed Ridgefield Station will be constructed on already impervious or disturbed urban land. The parking facility would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. Palisades Park Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – As this is an impervious area, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the review agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality. The proposed site plan shown in Appendix B, Figure 6 shows a

potential location for an underground stormwater facility. Further details are included in Section 14.2.3 – Mitigation Measures.

14.3.5. Leonia

14.3.5.1. Existing Conditions

Leonía is located within the Hackensack/Pascack Watershed Management Area. Two tributaries to Overpeck Creek cross the rail right-of-way in Leonía (Refer to Figure 14-1).

14.3.5.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are automobiles. Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

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

Both Light Rail to Tenafly (Preferred Alternative) and Light Rail to Englewood Route 4 are identical in their potential impacts and mitigation through Leonía. Consequently, the discussion below applies to both alternatives.

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-6 summarizes the modifications proposed for the rail right-of-way in Leonía. No work is proposed at the tributary to Overpeck Creek located at Station 1377+00; no impacts are anticipated at this location. The stream crossing identified at 1326+00 will require an additional span. The allowable limit for reconstructed rail construction within the 50-foot Riparian Zone associated with this crossing is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits; as a result, no impact to Riparian Zone elements is anticipated for identified stream crossings.

Table 14-6: Proposed Modifications to Waterbody Crossings in Leonia

Map No.	Location	Station	County	Municipality	Proposed Modifications
6	Tributary to Overpeck Creek	1326+00	Bergen	Palisades Park/Leonia	Add adjacent span
5	Tributary to Overpeck Creek	1377+00	Bergen	Leonia	No work planned

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – During in-stream construction, to prevent fill materials and excavated soils from entering the water column, cofferdams would likely be used for the second crossing where a new substructure is required for the adjacent span. Additionally, construction sites would be stabilized upon completion and construction timing, and disturbance will be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area. Further details are included in Section 14.2.3 – Mitigation Measures.

Leonia Station

Impacts – The proposed Leonia Station will be constructed on already impervious and disturbed urban land. The parking facility would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. Leonia Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – As this is an impervious area, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the review agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality. The proposed site plan shown in Appendix B, Figure 7 shows a potential location for an underground stormwater facility. Further details are included in Section 14.2.3 – Mitigation Measures.

14.3.6. Englewood

14.3.6.1. Existing Conditions

Englewood is located within the Hackensack/Pascack Watershed Management Area. Two tributaries to Overpeck Creek and Flat Rock Brook cross the rail right-of-way in Englewood (Refer to Figure 14-1). Flat Rock Brook is an approximate 35-foot wide concrete lined channel crossing under I-80/95 and the existing railroad right-of-way in the City of Englewood. Flat Rock Brook is a tributary to Overpeck Creek. Additionally, a culvert runs adjacent to the right-of-way between West Forest Avenue and Englewood Avenue.

14.3.6.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are automobiles. Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

Light Rail to Tenafly (Preferred Alternative)

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-7 summarizes the modifications proposed for the rail right-of-way in Englewood associated with Light Rail to Tenafly (Preferred Alternative). The stream crossings identified have an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The allowable limit for reconstructed rail construction within this 50-foot zone is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits; as a result, no impact to Riparian Zone elements is anticipated for identified stream crossings. Construction of a new box culvert that runs along the alignment between West Forest Avenue and Englewood Avenue would not impact the riparian zone as there is no vegetation associated with the culvert.

Table 14-7: Proposed Modifications to Waterbody Crossings in Englewood (Light Rail to Tenafly (Preferred Alternative))

Map No.	Location	Station	County	Municipality	Proposed Modifications
4	Flat Rock Brook (Concrete Channel)	1410+00	Bergen	Englewood	Add adjacent span
3	Tributary to Overpeck Creek (Culvert)	1421+40	Bergen	Englewood	Widen culvert
2	Tributary to Overpeck Creek	1541+60	Bergen	Englewood	Add adjacent span

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a

result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – During in-stream construction, to prevent fill materials and excavated soils from entering the water column, sheet piling would be used to support the railroad while constructing the new footings for the two new culverts; and cofferdams would be used to construct the new substructures for the two bridges. Additionally, construction sites would be stabilized upon completion and construction timing, and disturbance will be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area. Further details are included in Section 14.2.3 – Mitigation Measures.

Englewood VBF Option

Impacts – The optional VBF will be constructed on already impervious and disturbed urban land. The facility would be designed to incorporate stormwater management facilities (the size and location of these facilities will be determined during Final Design and Engineering). The proposed VBF is not within the SWRPA of a C1 waterway or within a Riparian Zone.

During construction, excavation activities may result in the potential for siltation of area waterways. The proposed project will not involve depletion of the water table from excessive withdrawal of groundwater; however, there is the potential that the proposed project will encounter groundwater during construction. Activities at the VBF may generate effluent consisting of sanitary waste, oil, solvents, and other chemicals associated with vehicle maintenance. Without mitigation, spills or mishandled materials associated with vehicle maintenance could affect both groundwater and surface water. In addition, underground storage tanks may be incorporated into the station design. Leaking tanks are a potential source of groundwater contamination.

Mitigation – Stormwater management facilities are proposed to maintain preconstruction run-off conditions in terms of water quantity and quality. Further details are included in Section 14.2.3 – Mitigation Measures.

Englewood Route 4 Station

Impacts – The proposed Englewood Route 4 Station will be constructed on already impervious and disturbed urban land. The parking facility would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. Englewood Route 4 Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – As this is an impervious area, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the review agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality. The proposed site plan shown in Appendix B, Figure 8 shows a potential location for an underground stormwater facility. Further details are included in Section 14.2.3 – Mitigation Measures.

Englewood Town Center Station and Englewood Hospital Station

Impacts – Englewood Town Center Station and Englewood Hospital Station are walk-up stations and will not include the construction of impervious parking areas. All station improvements, consisting of platforms, crosswalks, and platform canopies will be located within the existing rail right-of-way. Potential impacts associated with these station sites will be confined to those impacts described above in the rail right-of-way discussion.

Mitigation – None required.

Light Rail to Englewood Route 4

Rail Right-of-Way

Impacts – In Englewood, infrastructure improvements for Light Rail to Englewood Route 4 are limited to the linear distance from the border of Leonia to the proposed Englewood Route 4 Station. No improvements are proposed north of the proposed Englewood Route 4 Station. Improvements include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-8 summarizes the modifications proposed for the rail right-of-way in Englewood associated with Light Rail to Tenafly (Preferred Alternative). The stream crossings identified have an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The allowable limit for reconstructed rail construction within this 50-foot zone is 2,500 square feet. The construction along the right-of-way would be designed to stay within these allowable limits; as a result, no impact to Riparian Zone elements is anticipated for identified stream crossings.

Table 14-8: Proposed Modifications to Waterbody Crossings in Englewood (Light Rail to Englewood Route 4)

Map No.	Location	Station	County	Municipality	Proposed Modifications
4	Flat Rock Brook (Concrete Channel)	1410+00	Bergen	Englewood	Add adjacent span
3	Tributary to Overpeck Creek (Culvert)	1421+40	Bergen	Englewood	Widen culvert

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – During in-stream construction, to prevent fill materials and excavated soils from entering the water column, sheet piling would be used to support the railroad while constructing the new footings for the new culvert; and cofferdams would be used to construct the new substructures for the bridge over Flat Rock Brook. Additionally, construction sites would be stabilized upon completion and construction timing, and disturbance will be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area. Further details are included in Section 14.2.3 – Mitigation Measures.

Englewood VBF Option

Impacts – The proposed VBF will be constructed on already impervious and disturbed urban land. The facility would be designed to incorporate stormwater management facilities (the size and location of these facilities will be determined during Final Design and Engineering). The proposed VBF is not within the SWRPA of a C1 waterway or within a Riparian Zone.

During construction, excavation activities may result in the potential for siltation of area waterways. The proposed project will not involve depletion of the water table from excessive withdrawal of groundwater; however, there is the potential that the proposed project will encounter groundwater during construction.

Activities at the VBF may generate effluent consisting of sanitary waste, oil, solvents, and other chemicals associated with vehicle maintenance. Without mitigation, spills or mishandled materials associated with vehicle maintenance could affect both groundwater and surface water. In addition, underground storage tanks may be incorporated into the station design. Leaking tanks are a potential source of groundwater contamination.

Mitigation – Stormwater management facilities are proposed to maintain preconstruction run-off conditions in terms of water quantity and quality. Further details are included in Section 14.2.3 – Mitigation Measures.

Englewood Route 4 Station

Impacts – The proposed Englewood Route 4 Station will be constructed on already impervious and disturbed urban land. The parking facility would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. Englewood Route 4 Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – As this is an impervious area, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the review agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality. The proposed site plan shown in Appendix B, Figure 8 shows a potential location for an underground stormwater facility. Further details are included in Section 14.2.3 – Mitigation Measures.

Englewood Town Center Station and Englewood Hospital Station –

Impacts – Light Rail to Englewood Route 4 terminates at the proposed Englewood Route 4 Station. No improvements are proposed north of Englewood Route 4 Station. Consequently, no impacts are associated with these station site locations, as they are not proposed as part of this Build Alternative.

Mitigation – None required.

14.3.7. Tenafly

14.3.7.1. Existing Conditions

Tenafly is located within the Hackensack/Pascack Watershed Management Area. One tributary to Tenakill Brook cross the rail right-of-way in Tenafly (Refer to Figure 14-1). Tenakill Brook is a C1 waterway and includes a Special Water Resource Protection Area that extends for 300 feet on each side of the stream. Currently, the alignment crosses Tenakill Brook with one track and ballast. Land on the east and west sides of the right-of-way are planted with grass and trees.

14.3.7.2. Potential Impacts and Mitigation

No Build Alternative

Under the No Build Alternative, it is assumed that the CSX right-of-way would remain as an active rail line. No other operational changes or improvements would occur except those associated with the continued use of the infrastructure to serve freight customers.

The impact on water quality under the No Build Alternative would be from non-point source contaminants (i.e. petroleum, fuels and lubricants). These pollutants enter the surface waterways as stormwater runoff from roadways and parking lots and groundwater through percolation through permeable surfaces. The primary contributors of non-point source pollution in urban environments are automobiles. Freight trains may contribute to the pollution of runoff; however, the frequency of freight service on the Northern Branch alignment is minimal, resulting in proportionally less pollution than is generated by automobiles. It is likely that in the No Build scenario, the accumulation of pollution in stormwater and study area waterways will increase in proportion to the increase in automobile traffic.

Light Rail to Tenafly (Preferred Alternative)

Rail Right-of-Way

Impacts – Infrastructure improvements for the Build Alternatives include the removal and installation of tracks, placement of the ballast and subballast, installation of catenary poles, and construction or reconstruction of the drainage ditches and/or underdrains. These activities will occur within the existing railroad right-of-way, which is actively used for freight rail service. As a result, no new impervious area will be created, and the potential for additional water quality impacts related to the existing alignment are not greater than currently exist.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. Table 14-9 summarizes the modifications proposed for the rail right-of-way in Tenafly associated with Light Rail to Tenafly (Preferred Alternative). As described above in existing conditions, the stream crossing identified has an established associated SWRPA that extends 300 feet to each side of the stream. The allowable limit for reconstructed rail construction within the 300-foot zone is 15,000 square feet. Although no in-water work is planned, work is proposed above the existing crossing and within the alignment. Currently the alignment has one track with ballast, the remaining area contains grass and trees. Two additional tracks are proposed for this area that would require removal of the grass and trees.

Table 14-9: Proposed Modifications to Waterbody Crossings in Tenafly (Light Rail to Tenafly (Preferred Alternative))

Map No.	Location	Station	County	Municipality	Proposed Modifications
1	Tributary to Tenakill Brook	1640+10	Bergen	Tenafly	No work planned

During service operation, the action of vehicles traveling over the rails could deposit pollutants on the railroad bed, and the use of herbicides to maintain the right-of-way can contribute to polluted stormwater runoff. Herbicide applications along the alignment right-of-way will be required as part of ordinary railroad maintenance. The application of herbicides is regulated by State and Federal laws. Use in compliance with regulations will not result in the degradation of water quality in the study area. As a result, no impact to water quality is anticipated as a result of the service operation of the proposed light rail vehicles.

Mitigation – Construction sites would be stabilized upon completion and construction timing. Further details are included in Section 14.2.3 – Mitigation Measures.

Tenafly Town Center Station

Impacts – Tenafly Town Center Station is a walk-up station which will use a small portion of an existing parking area, as such no new stormwater management is anticipated. All station improvements, consisting of platforms, crosswalks, and platform canopies will be located within the existing rail right-of-way. Potential impacts associated with these station sites will be confined to those impacts described

Mitigation – None required.

Tenaflly North Station

Impact – The proposed Tenaflly North Station will be constructed on already impervious or disturbed urban land. The parking facility would include stormwater management facilities. The size and location of the stormwater management facilities will be determined during Final Design and Engineering. Although near to Tenakill Brook, the proposed Tenaflly North Station is not within the SWRPA of a C1 waterway or within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation – A stormwater management facility is proposed to maintain preconstruction run-off conditions in terms of water quantity and quality. Further details are included in Section 14.2.3 – Mitigation Measures.

Light Rail to Englewood Route 4

Impacts – Light Rail to Englewood Route 4 terminates at the proposed Englewood Route 4 Station. No improvements are proposed north of Englewood Route 4 Station. Consequently, no impacts are associated with these station site locations, as they are not proposed as part of this Build Alternative.

Mitigation – None required.

14.4. Summary of Potential Environmental Effects

There is little notable difference between the two Build Alternatives in terms of their potential effect on water quality. Table 14-10 provides a summary of the project elements described above.

Table 14-10: Summary of Potential Effect on Water Quality Associated with Project Elements by Build Alternative

Alternative	Northern Branch Alignment	Proposed Station Sites	Vehicle Base Facility
Light Rail to Tenaflly (Preferred Alternative)	10 stream crossings; one C1 waterway (Tenaflly); NJDEP permitting required	Five station sites with parking areas may require stormwater management facilities	Potential for groundwater contamination through spills or leaks of petroleum-based fluids. Best management practices will minimize potential for harm.
Light Rail to Englewood Route 4	8 stream crossings; no C1 waterways; potential for NJDEP permitting	Four station sites with parking areas may require stormwater management facilities	