

14. Water Quality

14.1. Chapter Overview

14.1.1. Introduction

This section discusses changes to the potential for activities associated with the development and operation of the Preferred Alternative to adversely affect water quality within the study area resulting from the modification of the Preferred Alternative as presented in the Northern Branch DEIS. The revisions specifically affecting water quality include:

- Change in project terminus: the Preferred Alternative ends in Englewood near the border with Tenafly; consequently, there would be no adverse effects on Tenakill Brook, located in Tenafly.
- West Side Avenue alignment: the Preferred Alternative's approximately 1.7-mile alignment along West Side Avenue in North Bergen resulted in three additional stream crossings.
- 69th Street Substation: the proposed location for the 69th Street Substation is adjacent to an unnamed tributary.
- 85th Street Viaduct and 85th Street Extension: a new viaduct is proposed over the CSX River Line tracks to connect the light rail tracks from West Side Avenue to the Northern Branch Corridor. An underpass constructed through the CSX River Line embankment would be used for the extension of 85th Street. The at-grade extension of 85th Street would require conversion of a currently undeveloped area of land to impervious surface.
- Relocation of Leonia Station parking deck: a parking deck is proposed to be developed within Overpeck County Park. Although the location of the proposed parking deck is partially on top of existing impermeable land, the full area of development would expand the area of impervious surface.
- Co-location of Englewood Route 4 Station and Vehicle Base Facility (VBF): the VBF is now proposed to be co-located with the Englewood Route 4 Station, reducing the amount of impervious surface, compared with the DEIS.
- Englewood Town Center Station: the Englewood Town Center Station has been relocated to the area north of Palisade Avenue and the project proposes to include double track in this area, where formerly only single track was proposed. To provide adequate right-of-way for the additional track and platform, a portion of the parking area and sidewalk associated with Depot Square Park would be used.
- Englewood Hospital and Medical Center: rail right-of-way widening at a stream crossing north of the Englewood Hospital and Medical Center Station would accommodate a second track and a pedestrian walkway.

During the DEIS comment period, the New Jersey Department of Environmental Protection (NJDEP) and the United States Environmental Protection Agency (USEPA) submitted comments addressing construction-phase considerations for maintaining water quality. NJDEP noted that activity within waterways is prohibited between March 1 and June 30. USEPA recommended using methods that maximize stream continuity when replacing culverts. These comments represent known construction methodology restrictions and best management practices (BMPs) that would be applied during the construction phase. An additional comment submitted by Tenafly presented concerns over the potential for construction phase activity to degrade the water quality in Tenakill Brook. The SDEIS Preferred Alternative would no longer require construction activity in Tenafly; more importantly, however, all construction activity would adhere to NJDEP and USEPA regulations and BMPs to protect water quality during both construction and revenue phases. These regulations and BMPs are described in the DEIS and apply to the SDEIS, as well.

14.1.2. Summary of Findings of the DEIS and the SDEIS

The study area is crossed by four identified water bodies contributing to the surface hydrology of the region (refer to Table 14-1), all of which flow into the Hackensack River, which feeds the New Jersey Meadowlands. There are multiple crossings of many of the water bodies as shown in Table 14-1 and Figure 14-1. There are no sole source aquifers in the study area.

Table 14-1: Waterbody Crossings

Stream Name	Classification*	Number of Crossings for Preferred Alternative
Cromakill Creek tributaries	C2-FW2-NT-SE2	3
Wolf Creek and tributaries	C2-FW2-NT-SE2	3
Overpeck Creek and tributaries	C2-FW2-NT-SE2	7
Flat Rock Brook	C2-FW2-NT-SE2	1
TOTAL		14

* 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).

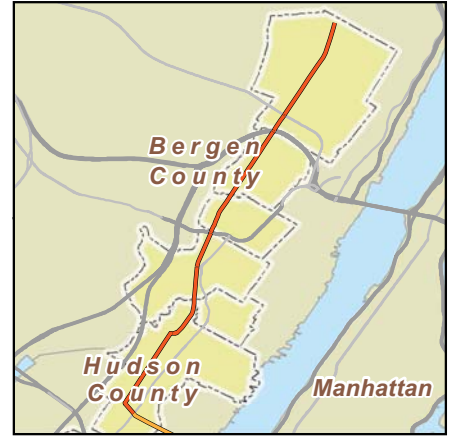
Two of the creek crossings, one on the border of Fairview and North Bergen and one located slightly farther south, were previously identified in the 2011 DEIS as Bellmans Creek based on mapping data from the New Jersey Meadowlands Commissions 2004 Master Plan. This information has been updated in this SDEIS to identify these crossings as tributaries to Wolf Creek based on NJDEP Surface Water Quality Standards data. Wolf Creek is a tributary to Bellmans Creek, which then flows into the Hackensack River.

The 2011 DEIS found that project elements proposed would have no adverse impact on water quality provided that appropriate mitigation measures and BMPs are followed during both the construction and operation of the project. Likewise, the revised elements of the Preferred Alternative are not anticipated to have an adverse impact on water quality following the same provisions. Specifically, the following mitigation measures and BMPs would help to ensure no adverse impact on water quality as a result of revisions to the Preferred Alternative:

- Improvements to the rail right-of-way would 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.
- During the operation of rail service, NJ TRANSIT's inspection and maintenance program would mitigate potential non-point source pollution from rail vehicles traveling on the right-of-way.
- All revised station sites for the Preferred Alternative would be constructed on predominantly existing impervious land. Station parking facilities, as well as the 69th Street Substation, would 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 VBF, which is now proposed to be co-located with the Englewood Route 4 Station, would include separate systems for handling stormwater runoff and wastewater from maintenance activities.

Northern Branch Study Area Waterways

Figure 14-1



① Waterway Crossing
 ● Proposed Stations
 ● HBLR Stations

Proposed Alignment

- At Grade
- Underpass
- Viaduct
- Hudson Bergen Light Rail

0 5,000 10,000 Feet

Source: Municipal Parks Departments and Jacobs



14.2. Methodology

The analysis was conducted in accordance with state and federal regulations intended to maintain and promote surface and groundwater quality. Water quality impacts were updated by review of NJDEP Surface Water Quality Standards N.J.A.C. 7:9B, NJDEP Water Resource Categories, Stormwater Management rules (N.J.A.C. 7:8), and the Flood Hazard Area Control Act (FHACA) rules (N.J.A.C. 7:7). The regulatory framework and methodology are the same as that described in the DEIS.

Water resources in the Northern Branch study area were identified first through a search of NJDEP's Surface Water Quality Standard data, which lists all water bodies regulated by NJDEP. The presence or absence of groundwater resources and sole source aquifers, identified through soil and geological data, has not changed since the 2011 DEIS. Surface water resource findings were verified through aerial photography. The resources listed in the following environmental review are complete insofar as existing documentation could identify. However, as stated in the DEIS, the potential exists 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.

14.3. Environmental Review

Following is an update to the discussion of the surface waters and the potential impacts to them within each municipality. Only those project elements that have been revised are discussed in terms of changes in potential impacts and mitigation measures. Information regarding potential impacts and mitigation for project elements that are the same as presented in the 2011 DEIS can be found as stated in that document.

14.3.1. Existing Conditions

There are no changes to the existing conditions as compared with the DEIS.

14.3.2. Potential Impacts and Mitigation

14.3.2.1. *No Build Alternative*

There are no changes to the impacts associated with the No Build Alternative as compared with the DEIS.

14.3.2.2. *Preferred Alternative*

Following is a description of the revisions to the Preferred Alternative and their potential for affecting surface and groundwater within the study area, followed by a description of the mitigation that is applicable to all of the impacted areas.

Rail Right-of-Way

From the Viaduct over the CSX North Bergen Yard to the 85th Street Viaduct, the rail right-of-way is proposed to run along the west side of West Side Avenue. This alignment, revised from the 2011 DEIS, results in three additional waterbody crossings where both the existing West Side Avenue and the proposed rail alignment cross unnamed tributaries to Cromakill Creek. The rail right-of-way installation is expected to take place within the existing road right-of-way; no additional impervious area, therefore, is anticipated to be created. The Viaduct over the CSX North Bergen Yard, which would be an elevated viaduct open underneath to allow for the passage of freight trains and businesses on West Side Avenue, is not anticipated to create impervious area with the exception of footings to support the structure.

Likewise, the 85th Street Viaduct would not result in additional impervious surfaces with the exception of footings.

The 85th Street extension would result in the creation of new impervious area for the length and width of the road right-of-way between West Side Avenue and the existing 85th Street roadway. The closest surface waterbody to the new impervious area at the 85th Street extension is an unnamed tributary to the Cromakill Creek, approximately 750 feet away.

North of the 85th Street viaduct in North Bergen, infrastructure improvements would primarily occur within the existing railroad right-of-way, which is actively used for freight rail service, and would result in no new impervious area. Water quality impacts related to the project would not be greater than those that already exist as they relate to the existing alignment. Improvements include 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. In Englewood, from West Forest Avenue to Englewood Avenue, improvements include the construction of a new, wider box culvert along the rail right-of-way.

One exception to this is the length of rail north of the Englewood Town Center Station where the right-of-way is proposed to be widened to accommodate a double track. Widening the track requires the conversion of a strip of grass approximately six feet wide by 550 feet long for the installation of tracks. The new impervious area would be approximately 200 feet from the channelized Overpeck Creek that runs through Englewood Town Center.

A second exception is the widening of the bridge crossing Overpeck Creek near Cambridge Avenue north of the Englewood Hospital and Medical Center Station. The stream crossing has an established associated Riparian Zone to protect the adjacent vegetated area extending 50 feet to each side of each stream. The bridge widening, which would accommodate both a second rail track and pedestrian improvements, would be designed to minimize disruption of the stream bed, banks, and riparian buffer.

Construction activities have the potential to result in short-term erosion and sedimentation impacts to water quality. 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.

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 would be required as part of ordinary railroad maintenance. The application of herbicides is regulated by state and federal laws. Use in compliance with regulations would 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.

Table 14-2 summarizes the modifications proposed for the rail right-of-way along the length of the Preferred Alternative.

Table 14-2: Proposed Modifications to Waterbody Crossings for Rail Right-of-Way

Map No.	Location	County	Municipality	Proposed Modifications
1	Tributary to Cromakill Creek	Hudson	North Bergen	No work planned
2	Tributary to Cromakill Creek	Hudson	North Bergen	No work planned
3	Tributary to Cromakill Creek	Hudson	North Bergen	No work planned
4	Tributary to Wolf Creek	Hudson	North Bergen/ Fairview	Replace existing culvert
5	Tributary to Wolf Creek	Bergen	North Bergen/ Fairview	Widen bridge to accommodate second track
6	Wolf Creek	Bergen	Fairview/Ridgefield	Tie replacement and minor rehabilitation, no in-water work proposed
7	Tributary to Overpeck Creek	Bergen	Palisades Park	Extend culvert to accommodate second track
8	Tributary to Overpeck Creek	Bergen	Palisades Park	No work planned
9	Tributary to Overpeck Creek	Bergen	Palisades Park/Leonía	Widen bridge to accommodate second track
10	Tributary to Overpeck Creek	Bergen	Leonía	No work planned
11	Tributary to Overpeck Creek	Bergen	Leonía	No work planned
12	Flat Rock Brook (Concrete Channel)	Bergen	Englewood	Widen bridge to accommodate second track
13	Tributary to Overpeck Creek	Bergen	Englewood	Extend culvert to accommodate second track
14	Tributary to Overpeck Creek	Bergen	Englewood	Widen bridge to accommodate second track and pedestrian crossing

69th Street Substation

The proposed 69th Street Substation would be constructed adjacent to a Cromakill Creek unnamed tributary on part of an industrial parcel that is currently vacant of structures and permeable. The facility would be designed to incorporate stormwater management facilities (the size and location of these facilities would be determined during Final Design and Engineering). The proposed 69th Street Substation would be built at an appropriate distance from the Cromakill Creek unnamed tributary to protect the riparian buffer. During construction, excavation activities may result in the potential for siltation of area waterways.

Leonía Station

The new proposed location of the Leonía Station parking deck, within Overpeck County Park, would be constructed partially on already impervious and disturbed urban land and partially on undeveloped vacant land. The parking deck would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities would be determined during Final Design and Engineering. The Leonía Station parking deck would not be within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Englewood Route 4 Station and Vehicle Base Facility

The proposed Englewood Route 4 Station and VBF would 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 would be determined during Final Design and Engineering. Englewood Route 4 Station is not within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Englewood Town Center Station

The proposed Englewood Town Center Station would include the reconfiguration of existing surface parking, as well as the acquisition and conversion of two commercial properties, all of which are already impervious and previously disturbed urban land. Additionally, one commercial property, which is already impervious, will be acquired and converted to a new park area. The improved surface parking area would include stormwater management facilities, as necessary. The size and location of the stormwater management facilities would be determined during Final Design and Engineering. The proposed Englewood Town Center Station reconfigured parking area and new park area are not within a Riparian Zone. During construction, excavation activities may result in the potential for siltation of area waterways.

Mitigation Measures

Mitigation measures are largely established by the regulatory and permitting agencies, and expressed in terms of regulatory requirements and BMPs. BMPs include both techniques and technologies developed by the regulatory agencies with the intent of offering sound guidelines for managing environmental resources. At the DEIS and SDEIS 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. Potential construction phase and maintenance phase mitigation measures and BMPs are the same as discussed in the DEIS. The possible locations for stormwater management facilities are shown on the station plans in Appendix B, although since many of the parking areas are proposed for existing impervious areas, stormwater management facilities may not be necessary. However, the project would include them should it be determined in coordination with the reviewing agencies that additional stormwater facilities are necessary to maintain preconstruction run-off conditions in terms of water quantity and quality.

During in-stream construction, to prevent fill materials and excavated soils from entering the water column, sheet piling would likely be used when widening or replacing culverts, and cofferdams would likely be used where a new substructure is required for the adjacent span. Throughout the rail right-of-way, construction sites would be stabilized upon completion and disturbance would be limited to ensure no impact to fish spawning/migration activities or passage of fish through the construction area.

14.4. Summary of Potential Environmental Effects of the DEIS and SDEIS

Table 14-3 provides a summary of the project elements described above and their potential effects on water quality.

Table 14-3: Summary of Potential Effect on Water Quality for Project Elements

Municipality	Project Element	Potential Effect
All	West Side Avenue and Northern Branch Right-of-Way	14 stream crossings with plans to widen bridges (4 locations), widen culverts (4 locations), and conduct structural rehabilitation (1 location); NJDEP permitting required; would create new impervious area at the 85 th Street extension and at the rail right-of-way widening north of Englewood Town Center Station
North Bergen	69 th Street Substation	Adjacency to unnamed tributary creates potential for short-term erosion and siltation; may require stormwater management facilities
North Bergen	91 st Street Station	Parking area may require stormwater management facilities
Ridgefield	Ridgefield Station	Parking area may require stormwater management facilities
Palisades Park	Palisades Park Station	Parking area may require stormwater management facilities
Leonia	Leonia Station	Parking area would require stormwater management facilities
Englewood	Englewood Route 4 Station and VBF	Parking area/VBF may require stormwater management facilities; potential for groundwater contamination through spills or leaks of petroleum-based fluids; best management practices would minimize potential for harm
	Englewood Town Center Station	Parking area may require stormwater management facilities
	Englewood Hospital and Medical Center	None