

APPENDIX I: Water Quality Technical Report

This report evaluates potential impacts to water resources along the rail corridor. Surface water resources within the study corridor consist of lakes, rivers, streams and wetlands located within the study area. For further detail pertaining to wetland protection please refer to Appendix J: Wetlands Technical Report. Issues relating to water quality and quantity resulting from project are not anticipated to be insignificant through the use of various avoidance and mitigation strategies applied to construction.

The Commonwealth of Pennsylvania oversees issues relating to Environment Protection through four separate departments. The Pennsylvania Department of Environmental Protection (PADEP) is the department that is responsible for the permitting and regulations related to water quality and stormwater. In New Jersey, all environmental matters, including permitting and regulation of water quality and stormwater, are the responsibility of the New Jersey Department of Environmental Protection (NJDEP).

I.1 Existing Conditions

I.1.1 Watercourses

The Pennsylvania Department of Environmental Protection, Bureau of Watershed Conservation publication of *Title 25. Environmental Protection, Chapter 93. Water Quality Standards*, identifies selected watercourses that are provided additional protection and that exhibit exceptional water quality and other environmental features. The classifications relevant to the project are described in Table I.1: Classification of Watercourses - Pennsylvania.

Table I.1: Classification of Watercourses - Pennsylvania

Resource ID	Resource Category	Description
CWF	Cold Water Fishes	Includes the maintenance and/or propagation of fish species (including the <i>Salmonidae</i> family), and additional flora and fauna which are indigenous to a cold water habitat.
WWF	Warm Water Fishes	Includes maintenance and/or propagation of fish species, and additional flora and fauna which are indigenous to a warm water habitat.
MF	Migratory Fishes	The passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which ascend to flowing waters to complete their life cycle.
TSF	Trout Stocking	Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
HQ	High Quality Water	A stream or watershed that exceeds levels necessary to support the propagation of fish, shellfish and wildlife and recreation in and on the water
EV	Exceptional Value Waters	(See description of "High Quality Water")

Source: *Title 25. Environmental Protection, Chapter 93. Water Quality Standards*

The New Jersey Department of Environmental Protection lists and classifies major rivers, creeks, streams and tributaries according to its Surface Water Quality Standards document N. J. A. C. 7:9B. Water bodies are classified according to their ecological or recreational significance, aesthetic character, suitability as a

viable fisheries resource and quality as a water supply. The classifications relevant to the project are as follows (Table I.2):

Table I.2: Classification of Watercourses – New Jersey

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.
TP	Trout Production	Waters that support the production of trout
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.
C1	Category 1	Receive protection from measurable changes in water quality due to their exceptional clarity, scenic setting, ecological value, water supply and fisheries resource.
NWSR	National Wild and Scenic River	Rivers protected under Section Seven of the Federal Wild and Scenic Rivers Act of 1968 (16 USC 1271-1278).

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

The Delaware River is listed on the National Wild and Scenic Rivers System from the northern boundary of the Delaware Water Gap National Recreation Area south to Washington's Crossing just north of Trenton, NJ. The corridor traverses approximately five miles through Zone 3 of the National Wild and Scenic River System. Section Seven of the Federal Wild and Scenic Rivers Act of 1968 (16 USC 1271-1278), as amended, prohibits the issuance of a federal permit for any project that may impact a river with values qualifying it for protection under the Act. In addition, the Delaware River is also protected by the New Jersey Wild and Scenic Rivers Program (N.J.S.A. 3: 8-45 et seq.). Water quality regulations within the Delaware River watershed are administered through the Delaware River Basin Commission.

The Surface waters that the rail alignment crosses in the study corridor are summarized in Table I.3: Summary of Surface Waters.

Table I.3: Summary of Surface Waters

Mile Post	Structure Type	Watercourse	Municipality	SWQS Classification	Planned Construction
Pennsylvania					
131.80	Steel girder bridge	Roaring Brook	City of Scranton, Lackawanna County	CWF	Yes
130.84	Steel girder bridge	Roaring Brook	Borough of Dunmore, Lackawanna County	CWF	Yes
130.73	Concrete arch bridge	Roaring Brook	Borough of Dunmore, Lackawanna County	CWF	Yes
130.38	Concrete Railtop culvert	Roaring Brook	Borough of Dunmore, Lackawanna County	CWF	Yes
130.22	Steel deck plate girder bridge	Roaring Brook	Borough of Dunmore, Lackawanna County	CWF	Yes
129.51	Concrete Railtop culvert	Roaring Brook	Borough of Dunmore, Lackawanna County	CWF	Yes
127.03	Concrete and stone arch and steel pipe	Roaring Brook	Roaring Brook Township, Lackawanna County	CWF	Yes
120.42	Stone arch	Langan Creek	Roaring Brook Township, Lackawanna County	HQ-CWF	No
119.59	Concrete arch bridge	Roaring Brook Tributary	Roaring Brook Township, Lackawanna County	CWF	Yes
118.54	Concrete arch culvert	Roaring Brook	Covington Township, Lackawanna County	CWF	Yes
117.80	Steel deck plate girder bridge	Elhurst Reservoir	Elmhurst Borough, Lackawanna County	HQ-CWF	Yes
117.76	Concrete arch culvert	East Branch Roaring Brook	Covington Township, Lackawanna County	HQ-CWF	Yes
115.36	Concrete Railtop culvert	Roaring Brook	Covington Township, Lackawanna County	HQ-CWF	Yes
113.50	Steel deck plate girder bridge	Larsen Pond	Border of Lehigh Township, Wayne County and Clifton Township, Lackawanna County	HQ-CWF	Yes
112.17	Concrete arch / box	Lehigh River	Lehigh Township, Wayne County	HQ-CWF	Yes

Mile Post	Structure Type	Watercourse	Municipality	SWQS Classification	Planned Construction
107.92		Hummler Run	Coolbaugh Township, Monroe County	HQ-CWF	Yes
107.39	Concrete arch bridge	Tobyhanna Creek	Coolbaugh Township, Monroe County	HQ-CWF	Yes
104.34	Concrete / stone arch	Hawkey Run	Coolbaugh Township, Monroe County	HQ-CWF	Yes
102.90	Steel I-beam bridge	Pocono Summit Lake	Coolbaugh Township, Monroe County	HQ-CWF	Yes
99.75		Forest Hill Run	Mount Pocono Borough, Monroe County	HQ-CWF	Yes
98.25		Yankee Run	Paradise Township, Monroe County	HQ-CWF	Yes
97.75		Tank Creek	Paradise Township, Monroe County	HQ-CWF	Yes
97.26		Devils Hole Creek	Paradise Township, Monroe County	HQ-CWF	Yes
95.05	Concrete / Stone arch	Cranberry Creek Tributary	Barrett Township, Monroe County	HQ-CWF	Yes
	Concrete / Stone arch and metal pipe	Devils Hole Creek Tributary	Paradise Township, Monroe County	HQ-CWF	No
90.95	Stone box culvert	Cranberry Creek	Barrett Township, Monroe County	HQ-CWF	No
87.37	Concrete arch bridge	Paridise Creek	Stroud Township and Paradise Township, Monroe County	HQ-CWF	Yes
86.06	Steel through girder bridge	Broadhead Creek	Stroud Township, Monroe County	TSF, MF	Yes
82.83	Concrete and stone arch	Broadhead Creek Tributary	Stroud Township, Monroe County	HQ-CWF	Yes
81.38	Stone arch	Sambo Creek	Borough of East Stroudsburg, Monroe County	CWF, MF	Yes
78.66	Steel through girder bridge	Broadhead Creek	Smithfield Township, Monroe County	HQ-CWF, MF	Yes
77.50	Steel deck plate girder bridge	Cherry Creek	Delaware Water Gap Borough, Monroe Township	CWF-MF	Yes
73.30	New steel bridge	Caledonia Creek	Delaware Water Gap Borough, Monroe County	CWF	No
73.17	Concrete double box culvert	Slateford Creek	Upper Mount Bethel Township, Northampton County	CWF	No
New Jersey					
73.10	Concrete arch bridge (multi-span)	Delaware River	Knowlton Township, Warren County	NWSR	Yes

Mile Post	Structure Type	Watercourse	Municipality	SWQS Classification	Planned Construction
73.10	Concrete arch bridge (multi-span)	Delaware River	Border between New Jersey and Pennsylvania	WWF-MF	Yes
71.67	Concrete arch culvert	Paulin's Kill Tributary	Knowlton Township, Warren County	FW2-TM	Yes
70.63	Concrete arch bridge (multi-span)	Paulin's Kill	Knowlton Township, Warren County	FW2-TM	Yes
69.74	Concrete arch culvert	Paulin's Kill Tributary	Knowlton Township, Warren County	FW2-TM	Yes
69.46	Concrete arch culvert	Paulin's Kill Tributary	Knowlton Township, Warren County	FW2-TM	Yes
69.03	Concrete arch culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	Yes
68.59	Concrete arch culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	Yes
67.76	Concrete arch culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	Yes
66.97	Concrete arch bridge and box culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	Yes
66.25	Concrete arch culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	Yes
65.93	Concrete pipe (24")	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	Yes
65.77	Concrete arch culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	No
65.22	Concrete arch culvert	Paulin's Kill Tributary	Blairstown Township, Warren County	FW2-TM	No
64.48	Concrete arch culvert	Paulina Creek	Blairstown Township, Warren County	FW2-TM	Yes
63.80	Concrete arch culvert	Camp Wasigan Brook	Frelinghuysen Township, Warren County	FW2-NT	No
63.05	Concrete arch culvert	Bear Creek Tributary	Frelinghuysen Township, Warren County	FW2-NT	Yes
62.30	Concrete arch culvert	Bear Creek Tributary	Frelinghuysen Township, Warren County	FW2-NT	Yes
60.50	Concrete Arch Bridge and box culvert	Bear Creek	Frelinghuysen Township, Warren County	FW1-TM	Yes
59.29	Concrete Arch culvert	Bear Brook	Frelinghuysen Township, Warren County	FW2-TP C1	No
58.29	Concrete Arch culvert	East Branch of Bear Brook	Frelinghuysen Township, Warren County	FW2-TP C1	Yes
57.73	Concrete Arch culvert	Pequest River Tributary	Green Township, Sussex County	FW2-TM	Yes
57.03	Concrete Arch culvert	Pequest River Tributary	Green Township, Sussex County	FW2-TM	Yes
55.85	Double Concrete Arch Bridge	Pequest River	Green Township, Sussex County	FW2-TM	Yes
53.69	Concrete Culvert, Pipe	Pequest River Tributary	Andover Borough, Sussex County	FW2-TM	Yes

Mile Post	Structure Type	Watercourse	Municipality	SWQS Classification	Planned Construction
53.44	Concrete Arch Bridge and box culvert	Andover Junction Brook + Route 206	Andover Borough, Sussex County	FW2-TM	Yes
52.86	Concrete Arch Culvert	Andover Junction Brook	Andover Township, Sussex County	FW2-TM	Yes
52.23	Concrete Culvert	Andover Junction Brook Tributary	Byram Township, Sussex County	FW2-TM	Yes
51.35	Concrete Arch Bridge	Wolf Lake Tributary	Byram Township, Sussex County	FW2-TM	Yes
50.93	Concrete Arch culvert	Wolf Lake Tributary	Byram Township, Sussex County	FW2-TM	Yes
50.26	Concrete Pipe/Culvert	Lubbers Run Tributary	Byram Township, Sussex County	FW2-TM	Yes
50.09	Concrete Arch culvert	Lubbers Run	Byram Township, Sussex County	FW2-TM	No
49.79	Concrete Arch culvert	Lubbers Run Tributary	Hopatcong Borough and Byram Township, Sussex County	FW2-TM	Yes
49.30	Concrete Arch culvert	Lubbers Run Tributary	Hopatcong Borough and Byram Township, Sussex County	FW2-TM	Yes
48.28	Concrete Arch culvert	Lubbers Run Tributary	Hopatcong Borough and Byram Township, Sussex County	FW2-TM	Yes
46.94	Concrete Slab Bridge	Lake Musconetcong Tributary	Stanhope Borough, Sussex county	FW2-NT	Yes
46.61	30" Concrete Pipe	Lake Musconetcong Tributary	Hopatcong Borough, Sussex County	FW2-NT	Yes
46.27	Concrete Arch Bridge	Musconetcong River	Border of Hopatcong Borough, Sussex County and Roxbury Township, Morris County	FW2-TM	No

I.1.2 Stormwater Management

Stormwater Management is an important issue concerning much of the developing areas of the world today. As more and more land within a particular watershed is developed and impervious surfaces are created stormwater runoff can increase dramatically. As stormwater runoff volumes increase, the receiving water courses and natural drainage systems become over burdened thus resulting in flooding areas which historically remained outside of the natural floodplain prior to development. Flooding disasters resulting from over development can be easily avoided through the implementation of adequate stormwater management planning.

All construction activities proposing to disturb more than five acres of land must be authorized by a National Pollutant Discharge Elimination System (NPDES) Permit from the U.S. Environmental Protection Agency. In Pennsylvania, in addition to meeting requirements for the NPDES, construction activities must also meet the existing 25 Pennsylvania Code Chapters 92 and 102 which requires all earth moving activities to develop, implement and maintain erosion control measures through an erosion and sedimentation plan. A General Permit, PAG-2 (1997 Amendment), is available for most construction activities except in the following situations: 1) Activities in special protection watersheds; 2) Activities that discharge hazardous chemicals or pollutants; 3) Activities that violate water quality standards; and 4) Activities prohibited from coverage under 25 Pennsylvania Code Chapter 92. An individual permit application must be submitted and approved under these circumstances.

Proposed work and discharge of stormwater runoff in to floodplains requires compliance with the NJDEP Flood Hazard Area Control Act (N.J.A.C. 7:13-2.8) and the Stormwater Management regulations (N.J.A.C. 7:8). In February 2004, the state of New Jersey adopted amendments to its Stormwater Management Rules which invoked a “special water resource protection area” surrounding all waters of the state designated as Category One (C1) including all perennial or intermittent tributaries to these waters that drain into the C1 water bodies within the same sub-watershed. The special water resource protection area is to be 300 feet on either side or the waterway perpendicular to the top of bank of all C1 waters. In addition, all new development within the vicinity of any Freshwater One (FW1) waters is to be designed to prevent any increase in stormwater runoff to the water body. The new stormwater 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 aforementioned stormwater management rules may be obtained for the enlargement of existing railroads or roadways; however, the NJDEP expects that improvements meet the new requirements where practicable. Exceptions to the stormwater management rules may also apply in developed urban areas of the state.

The proposed project will create an increase in impervious surfaces primarily at station sites. This increase in impervious surface can easily be mitigated for through the use of stormwater detention and /or retentions basins. Storm water retention basins are typically utilized to prevent most runoff from leaving a sight, encouraging ground water infiltration and filtering contaminants and trash while preventing downstream flooding. Stormwater detention basins on the other hand are primarily utilized to store water for a short period of time releasing it slowly into receiving watercourses to prevent downstream flooding. They may also be outfitted with various trash screens and or filtration systems to remove pollutants. The design of stormwater management facilities will also need to comply with the NJPDES in house policy of requiring 50% or total suspended solids (TSS) removal for disturbed or redeveloped existing impervious areas.

I.1.3 Watershed Management Areas

The Stormwater Management Act of 1978 (Act 167) requires Pennsylvania counties to prepare and adopt stormwater management plans for designated watersheds. Under section 14(a)(10) of the Act (Powers

and Duties of the Department of Environmental Protection) the State designated 355 watersheds within the state. The purpose of the Act is to assess the health of the watersheds and regulate construction activities in order to insure no further degradation of the water quality occurs. The majority of the Erie – Lackawanna Rail line lies within two major drainage basins, the Middle Delaware and the Upper Susquehanna River (Lackawanna River). A small portion of the rail line passes through the Lehigh River drainage basin. In Monroe County, the line passes through the Brodhead Creek Watershed and the Tobyhanna-Tunkhannock Creek Watershed. Both watersheds have Act 167 Stormwater Management Plans, which regulate construction activities.

According to the NJDEP Division of Watershed Management, the New Jersey portion of the study corridor lies within the Upper Delaware Watershed Management Areas (WMA). The Upper Delaware WMA includes Zones 1C, 1D and the upper part of 1E, the Paulins Kill, Pequest, Musconetcong, Lopatcong, Pohatcong, Flat Brook water ways.

I.1.4 Sole Source Aquifers

No sole source aquifer (SSA) systems are located beneath the project right-of-way in Pennsylvania. In New Jersey, the project right-of-way is within the Northwest New Jersey sole source aquifer, formally known as the “Fifteen Basin aquifer systems of New Jersey”, located in Morris, Sussex and Warren Counties. It is the second largest aquifer system of the seven that underlies the state of New Jersey. The project right-of-way is located within the United States Environmental Protection Agency’s (USEPA) project review area. The USEPA under Section 1424(e) of the Safe Drinking Water Act will review federally funded projects with the potential to contaminate a sole source aquifer system (SSA). An aquifer is defined by the USEPA as “an aquifer which contributes more than fifty percent of the drinking water to a specific area and its contribution would be impossible to replace if the aquifer were to become contaminated”.

Three regions exist within a sole source aquifer system including the recharge zone, the stream flow source zone and project review area. These three SSA regions may or may not overlap each other depending on specific site conditions and determinations set forth by the USEPA. The recharge zone for the Northwest New Jersey sole source aquifer is defined by “the outside boundaries of the Delaware Creek watershed, the Flat Brook watershed, the Lopatcong Creek watershed, the Musconetcong River watershed, the North Branch Raritan River watershed, the Papakating Creek watershed, the Paulins Kill watershed, the Pequest River watershed, the Pochuck Creek watershed, the Pohatcong Creek watershed, the South Branch Raritan River watershed, the Shimmers Brook watershed, the Van Campens Brook watershed and the Walkill River watershed. It also includes that part of the Millstone River watershed outside the Coastal Plain.” The stream flow source zone is defined as “the area that drains into the recharge zone.” The stream source flow zone consists of the area of the recharge zone and the Millstone River Watershed.

I.2 Environmental Effects

Environmental effects resulting from implementation of the proposed project can take two forms: direct and indirect.

Direct Effects

Construction activities associated with the project are anticipated to be minimal due largely to the inherent nature of the project to reactivate service on existing rail beds. Resurfacing and construction of new track along the existing alignment will not create any more impervious surface than already exists.

The entire length of the alignment from Scranton to Port Morris remains wide enough to accommodate two and three sets of tracks while the proposed plans call for only a single track and additional sidings at various locations along the alignment. At no point along the alignment, however, will the existing rail bed require widening or any new construction. Some areas of the alignment may require rehabilitation where erosion and all-terrain-vehicle use has eroded away portions of the embankment. In these locations soil conservation measures will be in place to prevent sedimentation of surface waters.

Rehabilitation of existing structures such as bridges and culverts spanning the many streams and rivers flowing below the alignment have potential for impacts. Through the use of environmental containment mechanisms this potential for impacts to surface waters are greatly reduced. Any new structures (bridges/culverts) over waterways or modification of existing substructures will require evaluation for scour protection. Selection of substructure design options and counter measures will need to be sensitive to environmental impacts. Particular aspects of the project where construction may present potential impacts to water quality are addressed below.

Repair work is required on bridges spanning Cherry Creek and Broad Head Creek. Work will consist of restoring concrete abutments, replacing deteriorated steel members and sandblasting and painting. Timing restrictions may be placed on the dates of construction as not to impact migratory fishes during spawning seasons.

A new bridge will be constructed allowing the passage of Slatford Road above the rail line. Slatford Creek is located approximately 250 feet away from the bridge site however soil erosion measures will be implemented during construction to avoid any disturbances to the creek resulting from stormwater runoff. This modification to the roadway will not increase the amount of impervious surface.

The Delaware River Viaduct will require the most extensive structural rehabilitation in the corridor, as it has experienced severe deterioration from weather and water due to its location spanning the Delaware River. Major reconstruction will be required for the length of the bridge. While the six large arches remain structurally sound all of the above smaller arches including the decking of the viaduct will require dismantling and reconstruction. In addition to the total reconstruction of the upper deck of the viaduct the lower arches will also require resurfacing and waterproofing. Environmental containment mechanisms will be in place as well as timing restrictions to prevent any disturbance to migratory fish spawning therefore making impacts as a result of construction to the viaduct negligible if any.

The Paulins Kill Viaduct will require stabilization of some of its concrete piers, resurfacing and waterproofing as well as vegetation removal near the base. No earthwork is proposed in the vicinity of the bridge and environmental containment mechanisms will be in place to prevent disturbance to the landscape and river below therefore impacts to the Paulins Kill are not anticipated.

The Warren County Route 521 (Hope Road) bridge is being replaced and has required earth disturbance as part of its reconstruction. Soil erosion preventative measures will be in place to protect the unnamed tributary to Paulins Kill and its associated wetlands located to the east of the bridge.

Station sites represent the most significant potential consequence to water quality because of the large amounts of impervious surface area required for parking facilities and the stormwater run off that will result. These impacts are however mitigable, if not totally avoidable through the use of wet ponds, stormwater infiltration or detention facilities and bio-retention Best Management Practices (BMP's) to prevent any impacts to water quality and quantity. Each stations potential impact is addressed individually below.

Scranton Station Area

No impacts to water quality are anticipated at the proposed Scranton station area. The site is located in an urban setting and will not result in any increased impervious surface or stormwater run-off. Stormwater issues will be addressed in accordance with local and regional watershed management plans. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Tobyhanna Station Area

Impacts to water quality are anticipated to be minimal if at all at the proposed Tobyhanna Station Area. The site consists of two historic structures, gravel parking area and an over grown storage area. While the station would likely create an increase in stormwater runoff, stormwater retention and detention systems will be constructed to avoid impacts to water quality. In addition construction will be completed in accordance with the local and regional watershed management plans. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Pocono Mountain Station Area

Impacts to water quantity are anticipated to be minimal at the proposed Pocono Station Area. The site consists entirely of undisturbed broadleaved deciduous forest bordered by an extensive wetland complex associated with Hawkey Run which is also near by. This particular location will require the establishment of stormwater retention basins in order to prevent any impacts to water quality resulting from increased stormwater runoff from the parking area. In addition construction will be completed in accordance with the local and regional watershed management plans. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Analomink Station Area

Impacts to water quality are anticipated to be minimal if at all at the proposed Analomink Station. The site consists partially of developed impervious surface and disturbed vegetation and soil. While the station will likely create an increase in stormwater runoff, stormwater retention or detention systems will be constructed in accordance with the local and regional watershed management plans. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

East Stroudsburg Station Area

No impacts to water quality are anticipated at the proposed East Stroudsburg Station. The site is located in an urban setting and will not result in any increased impervious surface or stormwater run-off. Stormwater run-off issues will be handled in accordance with the local and regional watershed management plans. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Delaware Water Gap Station Area

The proposed Delaware Water Gap Station Area will consist of a very large parking facility. The site would drain into two separate waterways, Cherry Creek (HQ-CWF, MF) and Broadhead Creek (CWF, MF) near their confluences with the Delaware River (NWSR - WWF-MF). The proposed parking facility will produce a very large amount of stormwater run-off due to the extensive parking area required to facilitate the station. In order to avoid impacts to water quality stormwater retention and/or detention systems will need to be constructed in accordance with the local and regional watershed management

plans. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Blairstown Station Area

The proposed Blairstown Station Area is devoid of any surface water features however its stormwater runoff drains into an unnamed tributary (FW2-TM/C2) of the Paulins Kill (FW2-TM/C2). While the station would create an increase in stormwater runoff resulting from the rooftops, platforms and parking areas, current stormwater management rules require that 100 percent of the increased runoff is recovered through various detention/retention basins. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Andover Station Area

The proposed Andover Station Area is located directly adjacent to Andover Junction Brook (FW2-TM/C2). Construction at the station site is not anticipated to have an impact on the brook however, construction may be limited to timing restrictions to protect the streams value as a fisheries resource. While the station would create an increase in stormwater runoff resulting from the rooftops, platforms and parking areas, current stormwater management rules require that 100 percent of the increased runoff is recovered through various detention/retention basins. Water quality impacts will be mitigated through various trash screening and natural pollutant filtration techniques.

Indirect Effects

Indirect effects are those that affect water quality and quantity due to the modification of existing drainage patterns and/or discharge of stormwater runoff. Such impacts could occur as the result of increased impervious surfaces (station areas, parking lots and the rail yard) associated with the proposed project. Run-off containing oil/fuels (hydrocarbons) could potentially contaminate surface waters and wetlands by direct contact resulting from increased rail service and from automobiles utilizing the parking lots. Overland flow of these contaminants will help to filter the majority of contaminants before they reach waterways or wetlands. In water work will be avoided to the maximum practicable extent and best management practices will be implemented. It is expected that adverse impacts to surface water quality and quantity would be minimal due to the various technological advancements and regulatory constraints in existence today.

Contamination from volatile organic compounds associated with rail transit operations is always a possibility. Minor insignificant amounts of grease, fluids, oils and other contaminants will be released during daily rail transit operations along the right-of-way. The timbers/concrete ties and rails associated with the reactivation of the alignment will create an insignificant amount of impervious surfaces within the right-of-way, as stormwater will flow directly onto the underlying pervious railroad ballast. The addition of new impervious surfaces at the proposed station locations along the corridor will not have a significant impact on groundwater recharge. Installation of containment measures at the proposed station locations and maintenance-of-way facilities will be implemented.

The stormwater management system will collect runoff from surface parking areas and deposit it into detention/retention basins. Stormwater retention basins are typically utilized to prevent most runoff from leaving a sight, encouraging ground water infiltration and filtering contaminants and trash while preventing downstream flooding. Stormwater detention basins are primarily utilized to store water for a short period of time releasing it slowly into receiving watercourses to prevent downstream flooding. They may also be outfitted with various trash screens and or filtration systems to remove pollutants.

The proposed build alternative will not involve depletion of the water table from excessive withdrawal of water from the underlying aquifer. No potential significant impacts to the aquifer are anticipated as a result of the build alternative.

I.3 Mitigation

Mitigation of water quality and quantity effects would first be directed towards avoidance, followed by minimization. Where impacts to water quality and quantity are unavoidable, mitigation will be conducted in the form of bio-retention, stormwater infiltration or detention facilities wet ponds plus other non-structural BMP's to prevent any impacts to water quality and quantity. Methods to minimize impacts would include the following:

- Use of elevated structure as opposed to embankment within environmentally sensitive areas (specifically, floodplains and watercourses).
- Surface waters would be diverted away from the project area and facilities to divert waters should be designed to limit the velocity of water flows.
- For water quality control, pre-treatment of stormwater (via water quality detention and retention basins as well as vegetated swales) before discharge to surface waters would be utilized.
- Earth moving activities should be conducted so as to minimize the amount of land disturbed.
- Stabilization of slopes, channels and ditches as soon as possible after the final earth moving activities have been completed.
- If it is not possible to permanently stabilize a disturbed area, interim stabilization measures shall be promptly implemented.
- Implementation of approved Soil Erosion and Sediment Control Plans/Water Encroachment and Obstruction Permits would minimize impacts to surface waters during construction.

The following methods could be employed to minimize direct impacts to fish resources:

- 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 would be left unobstructed.
- Prohibiting construction within waterways during anadromous fish spawning/migration activities.

As part of any permit approval, certain restrictions regarding construction activities located within migratory fish waterways would be required. Specifically, construction within such watercourses would most likely be prohibited between April 1 to June 30 and September 1 to November 30. The construction schedule will be developed accordingly.