Section 5
Mitigation Actions

5.1 Goals of Mitigation Actions

Mitigation includes steps taken to avoid environmental impacts of an action; to minimize impacts by limiting the degree or magnitude of an action; to rectify impact by repairing, rehabilitating or restoring the affected environment; to reduce or eliminate impact over time by preservation and maintenance operations over the life of the action; and to compensate for impacts by replacing or providing substitute resources or environments.

If the US Department of the Army (DA) issued a permit for a project as proposed by the New Jersey Turnpike Authority (NJTA), mitigation of adverse environmental impacts from the project would be required. This section sets forth generally an NJTA draft proposal to meet its obligation to mitigate. At this time, the US Army Corps of Engineers (USACE) does not express an opinion whether the NJTA proposal sets forth sufficient mitigation for the proposed project. Mitigation measures such as those discussed in this section will be considered for inclusion in a Department of the Army (DA) permit for the project, if issued. USACE judgment as to the sufficiency of mitigation would be made as part of a Record of Decision prepared to document a decision on the NJTA permit application.

The goals of the mitigation for either of the proposed construction alternatives include:

- Limiting the impact of project construction and operation on environmental, socioeconomic, and human health receptors.

- Meeting regulatory requirements and guidelines to compensate for unavoidable impacts, such as filling of wetlands or construction in floodplains.

Section 5.2 discusses construction-related mitigation that would be similar if either alternative were implemented. Section 5.3 details the mitigation measures proposed by the applicant for the Route 92 project. Section 5.4 discusses the mitigation that would be expected to be required if the US Route 1 Widening and Signal Removal alternative were built.

5.2 Construction-Related Impacts

5.2.1 Soils

In accordance with New Jersey State Law (NJSA 4:24-39 et seq.), a certified erosion and sedimentation control plan, in compliance with practices established in *Standards for Soil Erosion and Sediment Control in New Jersey*, would have to be filed with the appropriate Soil Conservation District.

Mitigation measures in accordance with standards set forth in the above-referenced document would need to be implemented during and after construction. The most efficient method by which to minimize soil erosion is to stabilize the soil immediately after disturbance has occurred. This could be accomplished by the following:

- Seeding immediately after the slope is graded with an appropriate groundcover.
- Placement of mulch or wood chips immediately after soil disturbance has occurred.
- Seeding of slopes simultaneously with road construction.
- Placement of temporary and permanent vegetative covers for soil stabilization.
- Placement of temporary stabilization of exposed soil on banks.
- Construction of temporary sediment basins.
- Installation of sediment barriers.
- Installation of drainage diversions.
- Placement of riprap for conduit outlet protection.
- Ensuring that the cut face of earth excavations and fills is no steeper than the safe angle of repose for the materials encountered and flat enough for proper maintenance.
- Ensuring that the permanently exposed faces of earth cuts and fills are vegetated or otherwise protected from erosion.
- Making provisions to safely conduct surface water to storm drains or suitable watercourses and to prevent surface runoff from damaging cut faces and fill slopes.
- Providing subsurface drainage in areas having a high water table, to intercept seepage that would adversely affect slope stability or building foundations, or create undesirable wetness.
- Ensuring that adjoining property is protected from excavation and filling operations.
- Ensuring that fill is not placed adjacent to the bank of a stream or channel unless provisions are made to protect the hydraulic, biological, aesthetic and other environmental functions of the stream.

Soils in portions of the Proposed Route 92 Corridor are acidic, having pH values that range from 4.0 to 6.0. Soils in the Route 1 Corridor may also be acidic. The construction specifications in the *Standards for Soil Erosion and Sediment Control in New Jersey* state, "exposed soils with a pH of less than 4.0 should be covered with a minimum of 12

inches of soil material no coarser than a sandy loam or soil material that can be corrected to a minimum pH of 6.5." Certain areas within both project corridors may contain acid-producing deposits, as discussed in Section 3.

5.2.2 Fugitive Dust

Some of the measures that would be expected to mitigate the impacts of fugitive dust include:

- Spraying water or on exposed areas
- Covering trucks hauling dust generating materials to and from the site
- Washing wheels and underbodies of construction vehicles prior to departure from the site
- Reducing vehicle flow over non-paved areas
- Routinely cleaning paved areas to lessen the amount of dust available for re-suspension

5.2.3 Noise

Proposed Route 92 would be located in both residential and commercial areas, while the US Route 1 Widening and Signal Removal alternative would mainly affect commercial receptors. Appropriate construction noise mitigation measures would be required for either alternative. These measures may include:

- Implement a Community Relations Program to inform the public of potential noise impact and measures that would be employed to reduce these impacts.
- Coordinate early with the roadway designers to reduce construction noise levels by sequencing construction activities and locating noisier activities away from sensitive receivers.
- Ensure that all construction equipment would be equipped with exhaust mufflers and maintained to minimize engine noise.
- Limit construction activities to Monday through Friday from 7 a.m. to 5 p.m.

5.3 Route 92 Mitigation Actions

5.3.1 Acid-Producing Deposits

During construction of proposed Route 92 between Perrine Road and US Route 130, where excavation of the Magothy and Raritan formations may take place, NJTA proposes to implement mitigation measures to reduce exposure of acid-producing deposits. In accordance with NJDEP's *Technical Manual for Stream Encroachment*, acid-producing deposits would be handled as follows:

Acid-producing deposits exposed in the course of construction activities but intended to remain in their original locations would be promptly buried under 1 foot of soil in an effort to reduce oxygen availability and minimize the rate at which acid is produced.

Exposed acid-producing deposits, including earth contaminated with such deposits, that are not promptly backfilled and covered would be removed and disposed of on or off the construction site in a suitable manner and location. Acid-producing deposits moved from their original locations would not be discharged into streams, spread over uncontaminated soil, or sold or distributed as topsoil or topsoil amendments suitable for plant growth. Instead, the deposits would be buried at least 2 feet beneath the land surface, in such a manner that the cover material would not be subject to accelerated erosion.

Stockpiles of acid-producing deposits awaiting burial would be covered with pulverized limestone at the rate of 30 tons per acre (1375 pounds per 1000 square feet) and then covered with a minimum of 1 foot of compacted soil free of acid-producing-deposits within one week after exposure, or before the pH of a well-mixed sample from the uppermost two inches of the deposit drops to 3.0, whichever occurs first. Whenever practicable, deposits would be buried the same day they are excavated.

5.3.2 Streams and Floodplains

Federal Executive Order 11988, Flood Plain Management (May 24, 1977), requires agencies to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Floodplain concerns were considered in the design of the proposed Route 92 project, and NJTA indicates that construction in floodplains, particularly the placement of fill material, has been minimized to the greatest amount feasible.

Three of the floodplain fills proposed for Route 92 would exceed NJDEP's 20% net fill rule (N.J.A.C. 7:13-2.14(a)1, discussed in Section 4.2.3). NJTA requested exemptions for these floodplain fills in its Stream Encroachment Permit Application submitted in December 2004.

Various forms of mitigation may be implemented to maintain the function and quality of the affected streams and floodplains during construction of proposed Route 92. These measures include the following:

- Bridges should be designed and constructed so that the natural streambed is maintained and not replaced by an artificial floor.

- Culverts should be designed with the capacity to pass the 100-year flood.

- Culverts should be designed to allow for the passage of fish during periods of low flow, where passage existed before project construction.

- Any proposed swales or channels discharging into an existing stream should incorporate the following: 1) settling basins to filter sediment prior to discharge into stream; 2) swales and channels stabilized with riprap, sod or appropriate vegetative cover prior to receiving stream flow; and 3) swales and channels designed to discharge in the direction of the existing stream flow and of a velocity so as not to cause erosion or interfere with the stream's natural flow pattern.

- Construction within streams and floodplains should take place during the anticipated low-flow period of July-August. This reduces the volume of water available to erode streambed soils, minimizing sediment transport downstream.

- Once construction within a stream is complete, disturbed areas should be stabilized and revegetated. Vegetation selected should be a ground cover species indigenous to the site.

- Construction materials should not be stockpiled in floodplain areas.

- Utilization of detention and/or retention basins that function to settle out sediment and some pollutants, thus improving the quality of water discharged downstream.

- Vegetative buffers, natural or manmade, should function to absorb sediment and pollutants from overhead runoff, provide food and cover for wildlife, stabilize soil to minimize erosion, and when present along a stream provide shade and suitable temperature regimes for aquatic life. At all stream encroachments, vegetative buffers should be restored if disturbed during construction. Trees, shrubs and herbaceous matter native to the existing stream should be planted and non-native species should be discouraged.

5.3.3 Water Quality

5.3.3.1 Stormwater Management

The New Jersey Pollutant Discharge Elimination System (NJPDES) permit for the New Jersey Turnpike system would require that NJTA control runoff and treat stormwater from proposed Route 92 prior to discharge into the receiving water bodies. The NJTA's proposed stormwater management system consists of a series of detention/water quality basins and/or grassed swales dependent upon various features affecting stormwater management design. Thirty stormwater management basins (SMBs) are proposed throughout the project corridor. NJTA advises that the proposed Route 92 project was designed to comply with the water quality requirements of the Flood Hazard Area stormwater management regulations, N.J.A.C. 7:13-2.8. The proposed stormwater management system was reviewed to assess its compliance with the Stormwater Management rules, N.J.A.C. 7:8-5, adopted in February 2004. Figure 5-1 presents the locations of the proposed stormwater management basins.

0 0.5 1 Miles

Scale: 1:30,000

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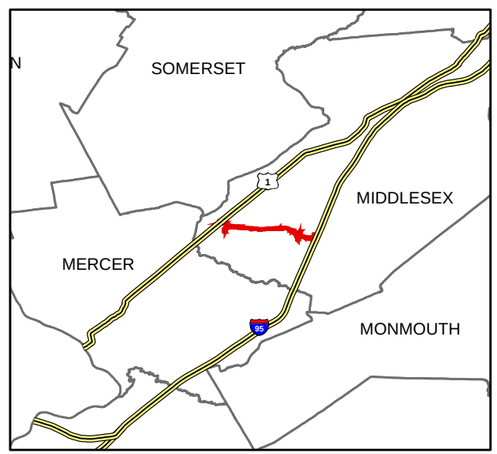

Legend

- Stormwater Management Basins and Segment Codes
- Rt 92 Footprint
- Segment Tributary Areas
- Bridges
- Culverts (24"-48")

Figure 5-1
Stormwater Management System

US Army Corps of Engineers
Proposed Route 92
Environmental Impact Statement

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CDM's Water Quality BMP Decision Matrix (WQ Matrix) was used to evaluate and select stormwater BMPs. The WQ Matrix was updated to specifically evaluate BMPs based on current New Jersey stormwater regulations. The WQ matrix was also updated to include New Jersey-specific stormwater BMP design criteria, as presented in the New Jersey Stormwater BMP manual. In evaluating a stormwater BMP, the WQ Matrix considers nineteen criteria grouped into four main categories:

1. Target Pollutant Reduction Goal,
2. Physical Characteristics,
3. Cost (Capital and O&M), and
4. Multipurpose Goals (Groundwater Recharge)

The four criteria categories were each assigned a weighting factor. This provides the ability to determine the desired influence each criterion will have on the score of a BMP. The weighting factors for this evaluation were set to 35 percent each for Target Pollutant Reduction Goal and Multi-purpose Goals (Groundwater Recharge), and 15 percent each for Physical Characteristics and Cost. This weighting factor distribution appropriately biases the matrix results to identify those stormwater BMPs that best meet the New Jersey removal efficiency requirements for total suspended solids (TSS) and provide groundwater recharge.

Table 5-1 presents the BMP selections from the WQ Matrix. These selections were then used in the water management model (WMM, as described in Section 4.2.3.1.3) to assess the TSS loads. The results of the WMM model are presented in Table 5-2. The table shows the expected TSS loads for the existing conditions, Route 92 with no BMPs, and Route 92 with the WQ Matrix recommended BMPs. The table shows an overall reduction in TSS of 80 percent from the Route 92 with no BMPs condition to the Route 92 with BMPs condition – the amount required by the 2004 NJDEP Stormwater Management Rules (N.J.S.A. 7:8-5.5).

The 2004 Stormwater Management rules (N.J.A.C. 7:8-5.4) require that the post-construction groundwater recharge is equal to pre-construction recharge, or that the increase in stormwater runoff volume of the two-year storm from pre-construction to post-construction is infiltrated. Recharge was calculated using the methods described in Chapter 6 of the NJ Stormwater Manual, based on the New Jersey Groundwater Recharge Spreadsheet (NJGRS). The spreadsheet is based on the 1993 NJ Geologic Survey *Report GSR-32: A Method for Evaluating Groundwater Recharge Areas in New Jersey, developed by NJGS*.

The spreadsheet is designed to estimate average annual groundwater recharge volume under both pre- and post-development conditions. Inputs to the spreadsheet include data on land use, soils, and impervious area. Extensive precipitation data has been compiled by the creators of the NJGRS to synthesize a series of typical storms

Table 5-1
Proposed Conditions in Tributary Areas and Proposed BMPs[1]

Tributary Area ID	Watershed	Impervious Area (Acres)	Imp. Area (%)	Pervious Area (Acres)	Pervious Area (%)	Total (Acres)	Proposed Best Management Practices (BMPs)
1A	Devil's Brook	7.5	56%	5.9	44%	13.5	Retention Basin
1B	Shallow Brook	7.6	63%	4.5	37%	12.2	Retention Basin
1C	Shallow Brook	3.9	64%	2.2	36%	6.1	Retention Basin
1D	Shallow Brook	3.1	54%	2.7	46%	5.8	Retention Basin
1E, 1F	Shallow Brook	11.0	82%	2.4	18%	13.4	Bioretention Swale & Manufactured Treatment Devices to Dry Detention Basin
1G	Devil's Brook	7.9	44%	9.9	56%	17.8	Retention Basin
1I, 1H	Shallow Brook	13.2	44%	16.7	56%	29.9	Bioretention Swale to Retention Basin; Vegetative Filter
1J	Shallow Brook	6.5	50%	6.4	50%	12.8	Bioretention Swale to Retention Basin; Vegetative Filter, Manufactured Treatment Devices
2A	Devil's Brook	5.3	34%	10.2	66%	15.5	Bioretention Swale to Dry Detention Basin; Manufactured Treatment Devices
2B	Devil's Brook	9.2	73%	3.4	27%	12.6	Bioretention Swale to Dry Detention Basin
2C	Devil's Brook	3.9	55%	3.3	45%	7.2	Bioretention Swale to Dry Detention Basin
2D	Devil's Brook	2.8	47%	3.2	53%	6.1	Bioretention Swale to Dry Detention Basin
2E	Devil's Brook	3.1	43%	4.0	57%	7.1	Manufactured Treatment Devices to Dry Detention Basin
2F	Devil's Brook	6.1	60%	4.0	40%	10.1	Retention Basin
2G	Devil's Brook	5.2	81%	1.2	19%	6.4	Bioretention Swale to Dry Detention Basin
3A, 3B	Heathcote Brook	7.7	47%	8.7	53%	16.4	Retention Basin; Vegetative Filter
3C	Heathcote Brook	8.9	89%	1.2	11%	10.1	Bioretention Swale to Retention Basin; Vegetative Filter; Manufactured Treatment Devices, Isolated Bioretention Swale
3D	Heathcote Brook	5.9	61%	3.7	39%	9.6	Retention Basin
3E, 3F	Heathcote Brook	11.7	66%	6.1	34%	17.8	Bioretention Basin; Isolated Bioretention Swale
3G	Devil's Brook	10.8	56%	8.6	44%	19.4	Retention Basin
3H	Devil's Brook	6.3	39%	9.6	61%	15.9	Bioretention Swale to Dry Detention Basin
Sec 3 (CR-683 and Perrine Rd.)	Devil's Brook	8.2	98%	0.2	2%	8.3	Retention Basins (C1 and DH1)
Sec 3 (Near Devil's Brook)	Devil's Brook	5.2	93%	0.4	7%	5.6	Bioretention Swale
Sec 1 (East of US 130)	Shallow Brook	3.7	98%	0.1	2%	3.8	Retention Basin
Sec 1 (US 130 - NE ramp)	Devil's Brook	5.9	52%	5.4	48%	11.3	Retention Basin
Sec 1 (US 130 - SE ramp)	Shallow Brook	4.4	51%	4.3	49%	8.8	Retention Basin
Subtotal	Devil's Brook	87.4	56%	69.3	44%	156.7	
Subtotal	Heathcote Brook	34.2	63%	19.7	37%	53.8	
Subtotal	Shallow Brook	53.6	58%	39.1	42%	92.7	
Total		**175.1**		**128.2**		**303.3**	

[1]Proposed conditions for recharge are with BMPs in place.

Table 5-2
Annual Loading of Total Suspended Solids and Projected Removal Efficiency

SMB Name		Tributary Area (acres)	Existing Loads (lb/yr)	Route 92 Loads w/o BMPs (lb/yr)	Route 92 Loads w/ Proposed BMPs (lb/yr)	Percent Reduction
SMB - 1A	Devil's Brook	13.5	8,171	7,522	1,504	80%
SMB - 1B	Shallow Brook	12.2	5,146	7,540	1,508	80%
SMB- 1C	Shallow Brook	6.1	3,203	3,863	773	80%
SMB - 1D	Shallow Brook	5.8	1,734	3,124	625	80%
SMB - 1E, 1F	Shallow Brook	13.4	7,635	10,683	2,137	83%
SMB - 1G	Devil's Brook	17.8	3,397	8,130	1,626	80%
SMB - 1I, 1H	Shallow Brook	29.9	13,303	13,593	2,719	80%
SMB - 1J	Shallow Brook	12.8	4,353	6,591	1,318	80%
SMB - 2A	Devil's Brook	15.5	2,332	5,653	1,131	73%
SMB - 2B	Devil's Brook	12.6	1,813	9,012	1,802	96%
SMB - 2C	Devil's Brook	7.2	1,107	3,925	785	96%
SMB - 2D	Devil's Brook	6.1	923	2,864	573	96%
SMB - 2E	Devil's Brook	7.1	1,008	3,197	639	86%
SMB - 2F	Devil's Brook	10.1	1,562	6,073	1,215	80%
SMB - 2G	Devil's Brook	6.4	868	5,054	1,011	68%
SMB - 3A, 3B	Heathcote Brook	16.4	2,644	7,871	1,574	80%
SMB - 3C	Heathcote Brook	10.1	5,429	8,602	1,720	81%
SMB - 3D	Heathcote Brook	9.6	1,516	5,865	1,173	80%
SMB 3E, 3F	Heathcote Brook	17.8	5,875	11,561	2,312	86%
SMB - 3G	Devil's Brook	19.4	2,830	10,838	2,168	80%
SMB- 3H	Devil's Brook	15.9	2,495	6,579	1,316	96%
Section 3 (CR-683 & Perrine Rd.)	Devil's Brook	8.3	1,317	7,874	711	80%
Section 3 (Near Devil's Brook)	Devil's Brook	5.6	664	5,009	1,192	61%
Section 1 (East of US 130)	Shallow Brook	3.8	2,430	3,554	892	80%
Section 1 (US 130 - NE ramp)	Devil's Brook	11.3	2,828	5,960	1,575	80%
Section 1 (US 130 - SE ramp)	Shallow Brook	8.8	1,843	4,460	501	80%
Subtotal	Devil's Brook	156.7	31,315	87,690	17,248	82%
Subtotal	Heathcote Brook	53.8	13,948	33,899	6,779	83%
Subtotal	Shallow Brook	92.7	39,647	53,408	10,473	81%
Total		303.3	84,910	174,997	34,500	82%

representing an average year for each region. In order to meet the NJ Stormwater Regulations, BMPs or other engineering controls must be installed to maintain 100 percent of the pre-construction average annual recharge. The NJGRS calculates the volume of water that is recharged in an average year under both existing and proposed conditions. The difference is the "recharge deficit", or the volume of water that must be infiltrated by one or more BMPs. Table 5-3 presents a summary of the average annual groundwater recharge values as calculated by the spreadsheet. The calculations show that the project would increase recharge which will provide cleaner sustained base-flow.

5.3.3.2 Roadway Deicing

NJTA will be required to consider, where necessary, options to reduce the impact of deicing salt in highway runoff from proposed Route 92, depending on the degree of actual impact and sensitivity of specific areas to salt in the runoff. These options include, but may not be limited to, alternative deicing materials, modified application rates and procedures, and minimizing or prohibiting the use of deicing salt in sensitive areas with warning provided to motorists of potentially hazardous driving conditions.

5.3.3.3 Spills of Hazardous Materials

NJTA would be required to employ spill mitigation measures immediately upon the spilling of any fuel or other hazardous materials on Route 92. Spilled materials could be recovered from the road surface, the shoulder, the drainage channels, and if necessary, the surface of the stormwater management basins. Should a substantial quantity of liquid spill on proposed Route 92, it would flow to a stormwater detention basin, from which it would be pumped into a recovery truck.

5.3.4 Wetlands and Open Space

NJTA states that the design of proposed Route 92 was developed and refined to comply with the federal government's"no net loss" wetland policy, which seeks to avoid and minimize wetland impacts to the greatest extent practicable. USEPA's 404(b)(1) guidelines, intended to implement this policy, involve the evaluation of project alternatives to first avoid wetland impacts. The second step involves evaluation of project modifications to minimize unavoidable wetland impacts. The third step involves development of a mitigation program to mitigate for the unavoidable wetland impacts.

The proposed Route 92 alignment was selected to avoid wetlands to the extent practicable by proposing the highway in open field areas that are generally parallel with and south of Friendship Road. Alteration to Wetland Units 1, 2, 3 and 7 (see Figure 3-11 in Section 3) mostly involves filling along the margins of the wetlands to avoid further fragmentation of the forested wetlands to the north and south of the proposed alignment. This design also looks to limit adverse effects to the wildlife habitat in these forested wetlands, as described in Section 4.2.3.4. Wetland Units 4, 5 and 6 are oriented in a north to south direction along Devil's Brook and the Amtrak tracks in the west central portion of the alignment. Due to their orientation, these wetland units could not

Table 5-3
Average Annual Groundwater Recharge Summary*

BMP Tributary Area	Tributary Area (acres)	New Impervious Area Created by Rt 92 (acres)	Existing Conditions Recharge (in/yr)	Proposed Conditions Recharge (in/yr)	Recharge Deficit (ft^3)	Calculated BMP Recharge (ft^3)
1A	13.46	4.17	5.72	5.09	31,000	730,000
1B	12.17	3.19	5.57	4.35	54,000	970,000
1C	6.07	1.74	1.73	0.87	19,000	440,000
1D	5.79	2.74	7.68	4.86	59,000	370,000
1E, 1F	13.39	9.71	5.37	1.84	170,000	180,000
1G	17.82	6.71	9.61	6.51	200,000	920,000
1I, 1H	29.92	7.19	6.78	5.04	190,000	190,000
1J	12.83	6.14	8.26	4.56	170,000	+
2A	15.46	4.91	6.70	4.82	110,000	+
2B	12.63	8.95	8.47	2.50	270,000	+
2C	7.21	3.62	8.71	4.17	120,000	+
2D	6.07	2.65	6.53	3.52	66,000	+
2E	7.06	2.81	6.31	4.64	43,000	140,000
2F	10.11	5.97	10.83	4.57	230,000	700,000
2G	6.38	5.02	7.58	1.76	130,000	160,000
3A, 3B	16.35	5.78	9.64	6.66	180,000	430,000
3C	10.06	7.90	4.69	0.99	130,000	890,000
3D	9.60	5.79	11.81	4.69	250,000	680,000
3E, 3F	17.81	10.65	8.86	4.18	300,000	1,400,000
3G	19.37	10.61	11.93	5.32	460,000	+
3H	15.89	6.03	9.61	6.05	210,000	+
Sec 3 (CR-683 and Perrine Rd.)	8.32	8.04	5.97	0.19	80,000	150,000
Sec 3 (Near Devil's Brook)	5.60	4.50	10.10	5.69	180,000	+
Sec 1 (East of US 130)	3.80	3.67	10.07	6.48	110,000	130,000
Sec 1 (US 130 - NE ramp)	11.32	5.07	2.61	0.52	42,000	590,000
Sec 1 (US 130 - SE ramp)	8.75	3.59	10.47	0.10	310,000	470,000
Total	**303.3**	**147.1**			**4,110,000**	**9,540,000**

* Calculated using the New Jersey Groundwater Recharge Spreadsheet (NJDEP, 2004)

be avoided if an effective connection to US Route 1 was to be achieved. The two finger-like extensions of the northern forest towards McCormack Lake provide a secluded travel corridor habitat as well as a limited area of interior forest habitat.

Wetland impacts were reduced through design modifications including reducing the median width through the Devil's Brook wetland complex and replacing slopes with retaining walls to minimize wetland filling. To further reduce wetland impacts and impacts to wildlife utilization of wetlands along Devil's Brook, bridges are proposed rather than fill to support sections of the roadway (see Figure 5-1). Shading impacts from the bridge structure may result in some modification of the underlying plant community; however, there would be less loss of wetland area and the wildlife travel corridor would remain. See Section 4.2.3.5.3 for a discussion of wildlife habitat impacts and Section 5.3.5 for mitigation measures.

The highway storm drain system was designed with several storm water detention/water quality basins along the proposed highway. Although not proposed as wetland mitigation areas, these basins would serve wetland functions of flood storage, flood flow alteration, and sediment trapping. The wetland units along the alignment are all rated as high to moderate for these wetland functions. Use of stormwater best management practices would serve to reduce indirect wetland impacts associated with highway runoff, namely increased rates of runoff and effects of non-point source runoff constituents to surface water quality. The stormwater basins are designed to reduce the flood flow discharges from the highway by detaining runoff and releasing it slowly to adjacent lands and waterways. Removal of sediment and the contaminants adsorbed to sediment in project detention basins would reduce the amount to sediment transported to natural wetlands. The project detention basins would reduce sediment build-up in wetlands as compared to a drainage system with no detention basins.

The wetlands that would be temporarily altered during construction would be restored in place after construction is completed. Temporarily altered wetlands include those wetland areas that would be altered during construction of adjacent retaining walls, slope grading, temporary access roads or staging areas. Upon completion of highway construction, temporarily altered wetlands would be restored to pre-construction grades, and planted with native wetland plants to restore the plant community.

To mitigate for the unavoidable direct permanent wetland impacts, NJTA proposes to create and maintain approximately 57 acres of wetlands and open water on land north and south of the proposed highway alignment, east of Haypress Road. The new wetland would have a hydrologic connection to the wetland bordering Devil's Brook. The mitigation plan would provide an approximately 4.5:1 ratio of created wetlands to permanently altered (filled or shaded) wetlands. (An excerpt of the conceptual wetland mitigation plan is provided in Appendix G.) The replacement wetland would be located within the same watershed as the majority of the wetland losses, and is designed to create a wetland complex composed of emergent marsh and wet meadow (12.24 acres), scrub-shrub wetland (8.2 acres) and forested wetland (36.7 acres). Approximately 0.85

acres of open water would also be created. NJTA proposes further mitigation in the form of preservation of 202 acres of existing forested wetland and upland in the vicinity of Friendship Road and Miller Road. Therefore, a total of approximately 260 acres would be preserved as a result of the mitigation plan.

Wetland replacement projects that are properly planned, designed, and constructed according to the design can be and have been successful. USACE believes that the keys to success are collection of adequate information on site hydrology prior to design and careful design based on the hydrological data collected. In addition, creation of forested wetland requires several decades for mature trees to grow. USACE and other federal and state agencies have evaluated wetland mitigation projects and have developed stringent review criteria and standards for mitigation plans and permit conditions to incorporate those standards into permits to improve wetland mitigation success. The Route 92 project sponsor proposes approximately a 4.5:1 ratio of mitigation wetlands to filled wetlands, an increase over suggested mitigation ratios. Final design plans and construction specifications will be developed to construct mitigation wetlands so there is a net gain of wetlands as a result of this project.

Creation of replacement wetlands and preservation of 202 additional acres of forested wetland and upland would also mitigate the conversion of land encumbered under the Green Acres program to highway use.

5.3.5 Wildlife

NJTA states that the proposed Route 92 project looks to minimize adverse impacts to wetland and upland habitats by avoiding loss of important habitat to the extent practicable. Bridging Devil's Creek and the associated riparian forest reduces direct impacts to this travel corridor, its principal wildlife function. No additional measures are proposed to mitigate the highway project to the two forest tracts north of McCormack Lake. Where the highway would be constructed at grade, adjacent to or through other forested land, preserving existing trees or replanting trees within the right of way to the maximum extent practicable is intended. This would minimize loss of woodlands and minimize the horizontal extent of adverse edge impacts into these woodlands.

Planting trees along the entire highway alignment through open field areas (grassland habitat) is not contemplated. Planting trees along the highway would serve to constrict the fields with a tree row and reduce the use of these fields by grassland birds, which would perceive these fields as small isolated patches. Maintaining grassy strips along the highway through open field areas would maintain the "openness" of these areas. Essentially, birds would be more likely to perceive the grass strip along the highway extending to the adjacent open fields as a single area. Placement of shrub masses or tree clumps scattered along the highway would provide perching habitat for some grassland birds (e.g. eastern meadowlark, grasshopper sparrow, loggerhead shrike and northern shrike).

5.3.6 Protected Species

5.3.6.1 State Endangered Species - Southern Arrowhead

A portion of the state-endangered southern arrowhead population would be adversely impacted by construction of proposed Route 92. Locations of these plants within and outside of the proposed ROW have been located and surveyed. Field studies indicate that southern arrowhead tends to grow in areas with a relatively open canopy, deep organic layer in the substrate, and either moderate ponding or shallow depth to groundwater. Studies also concluded that southern arrowhead is likely growing in all areas of suitable habitat within the Devil's Brook area, and the species seems capable of colonizing microhabitats (i.e., precise locations within a habitat) that meet the necessary criteria for suitable habitat.

An estimated 25% of the southern arrowhead population within the proposed ROW would be impacted by the construction of Route 92. This impact would occur due to either disruption by construction equipment, filling or shading by construction. The placement of snow fencing at the proposed limits of disturbance and monitoring of construction equipment movement would reduce the potential for arrowhead plants to be destroyed needlessly. Transplanting would be the preferred method for protecting individuals within the path of construction, and the chance of success for transplanting southern arrowhead is relatively good.

Individual plants within the limit of disturbance may be dug up prior to the start of construction activities and transplanted elsewhere within the Devil's Brook project area. Individual transplants should be distributed among the existing colonies of southern arrowhead, provided there appears to be sufficient microhabitat available to accommodate additional plants. If adequate area within existing colonies is not available, then alternative locations for transplanting the species must be identified.

As the preferred habitat of southern arrowhead is very specific and not always easily identified, transplanting to random locations within the Devil's brook area is not recommended. The findings of the field study can be used to identify specific locations that meet all the habitat criteria except for canopy cover. Selected trees can be removed in these locations to open the canopy. Southern arrowhead plants can then be transplanted into the areas of created habitat. Restriction on the timing of transplanting, length of time the plants can be held before transplanting, and methods of holding plants must be developed in order to maximize transplant success.

Another method for reestablishing the population lost due to construction of proposed Route 92 is seed propagation. Seeds can be collected from specimens within the Devil's Brook project area after flowering, or obtained from commercial seed sources (southern arrowhead is a common plant in the southeastern United States). Use of local seeds would be preferred. The proportion of seeds taken should not threaten the existing southern arrowhead colonies.

The seeds would be propagated in a greenhouse environment and planted at the appropriate time in appropriate habitat within the Devil's Brook area. As with the transplanting of existing individuals the propagated plants must be located either within existing colonies or within created habitat. This method could be used in combination with the transplanting of individuals. The advantages of this method either alone or with transplanting are the increased chance of success (i.e., percent survival of planted individuals) and the opportunity to increase the size of the population in the Devil's Brook area. If transplanting alone were performed and some of the plants did not survive, there would be a net loss of individuals from the project. If propagation were performed, then many more plants could be introduced to the Devil's Brook area, thereby increasing the likelihood that more plants would survive and become a viable population.

NJTA states that in an effort to save plants situated between the limits of disturbance and the ROW boundary, typical ROW line fencing would not be installed in the Devil's Brook wetland area.

In its review of the revised 1999 stream encroachment permit, the NJDEP Land Use Regulation Program contacted the NJDEP Office of Natural Lands Management, Division of Parks and Forestry (DPF) regarding the southern arrowhead impacts resulting from the construction of proposed Route 92 and appropriate mitigation. The DPF made recommendations in its response memorandum dated June 30, 1999 regarding potential mitigation options for the southern arrowhead plants and habitat impacted by the proposed Route 92 project. The DPF noted its lack of experience with transplantation, but indicated that transplantation could be accomplished, provided that a rigorous monitoring and maintenance program for the transplanted plants was implemented.

5.3.6.2 State Species of Concern - Savannah Sparrow and Bobolink

In a comment on the DEIS, NJDEP suggested that additional grassland habitat for savannah sparrow and bobolink, state species of concern, be created as mitigation for the grassland habitat displaced by proposed Route 92. This will be considered if the project advances.

5.3.7 Noise

Although up to six Category B receivers would experience noise levels that equal or exceed 67 dBA, only five were evaluated for noise abatement measures. The impacted residential receptors located outside the proposed Route 92 ROW are R-6, R-13, R-14, R-16 and R-17. The Boy Scouts of America site (R-12) is located within the Route 92/US Route 1 ROW; therefore, NJTA proposes to incorporate it as part of the Route 92 project. For the commercial receivers (C-1 and C-4) that were predicted to have noise levels equal to or greater than 72 dBA, FHWA regulations (23 CFR 722) state that NAC noise levels only apply to areas that have regular human use and do not apply to parking lots, industrial areas, and open spaces. FHWA does not require evaluating noise abatement measures that reduce exterior noise impacts for commercial land uses. In addition,

barriers may not be suitable for commercial development, because they tend to block advertisement and visibility of the development from the street.

Noise abatement measures were evaluated based on procedures provided in *Highway Traffic Noise Analysis and Abatement Policy and Guidance* (FHWA, 1995) and *Policy for Construction of Sound Barriers* (NJTA, 1991). These noise abatement measures included:

- Traffic management measures (e.g. traffic control devices and signing for prohibition of certain vehicles types, time-use restrictions for certain vehicle types, modified speed limits and exclusive land designations);
- Alteration of horizontal and vertical alignments;
- Acquisition of property rights (either in fee or lesser interest) for the construction of noise barriers;
- Construction of noise barriers (including landscaping for aesthetic purposes) within or outside the highway right-of-way;
- Use of noise insulation at public use or nonprofit institutional structures.

The NJTA traffic noise policy for construction of sound barriers establishes criteria for evaluating noise abatement barriers. These criteria include:

- Noise levels from the New Jersey Turnpike must be projected to exceed an L_{eq} of 67 dBA at the exterior of the homes immediately adjacent to the Turnpike ROW;
- The New Jersey Turnpike roadway itself must be at least 12 feet closer to an existing home after construction;
- A proposed barrier must be expected to cause a minimum reduction of 4 dBA at the home(s);
- The cost of the proposed barrier must be less than $45,000 per dwelling unit to be protected;
- Construction must be feasible from an engineering perspective in the opinion of NJTA, and
- The height of the barrier shall not exceed 26 feet, unless the NJTA Executive Director determines that extraordinary circumstances justify a higher barrier in a particular case.

The following subsections present the results of the noise abatement evaluation for the impacted receivers.

5.3.7.1 Traffic Management

In order to achieve a 5-dBA reduction, the speed limit would have to be reduced along designated portions of proposed Route 92 by approximately 25 mph (typically about a 1 dBA reduction for every 5 mph reduction in speed). This measure does not appear to be feasible because it would adversely affect traffic flow along proposed Route 92. Other approaches would require limiting truck traffic along proposed Route 92 or restricting the hours truck traffic would be able to access the highway. Neither option appears feasible given that Route 92 would be a major throughway in this region, and restrictions on truck traffic would be inconsistent with the stated purpose and need.

5.3.7.2 Horizontal and Vertical Alignments

NJTA does not consider adjustment of the horizontal or vertical alignment of proposed Route 92 to be a feasible option, given that existing vertical alignment is relatively flat and that adjusting the horizontal alignment would affect property owners adjacent to the corridor. In order to achieve a 5-dBA reduction, the road would have to be moved approximately twice the distance from where it is currently proposed from each affected receptor. For example, if a receptor were located 100 feet away from the edge of the proposed roadway, it would have to be adjusted another 100 feet away from its existing location.

5.3.7.3 Noise Insulation

As there are no public or nonprofit institutions in the project study area outside the proposed ROW, provision of noise insulation at institutional sites is not applicable as a mitigation measure.

5.3.7.4 Noise Barriers

Noise barriers are solid obstructions built between the highway and sensitive receivers along the highway. Effective noise barriers may reduce noise levels by 10 to 15 dBA. Barriers can be formed from earthen berms or from high vertical walls. Noise barriers do have limitations. These limitations include:

- To be effective, the barrier should extend along a highway four times as far in each direction as the distance from the receiver to the barrier.
- The barrier must break the line of sight from the roadway to the receptor in order achieve a 5-dBA noise level reduction.
- Openings in noise walls for driveway connections or intersecting streets severely reduce the effectiveness of the barriers.

Noise barriers were evaluated for each of the impacted residential receivers (R-6, R-7, R13, R-14, R-16 and R-17). Initially, a barrier height of 10 feet was chosen because it is the minimum height that was determined to achieve at least a 4-dBA noise level reduction for most of the receivers. A length of 600 feet erected at the ROW was evaluated to try to achieve the necessary 4-dBA-noise reduction at each receiver. However, a barrier of

these dimensions did not meet the necessary 4-dBA noise reduction for receivers R-16 and R-17, and therefore, a barrier height of 12 feet was evaluated. The additional 2-foot increase in barrier height did provide greater noise reduction by an additional 1 dBA. However, neither the 10-foot nor 12-foot barrier heights would meet the NJTA cost limit of $45,000 per residential dwelling affected by noise (NJTA, 1991). Therefore, NJTA does not recommend a sound barrier for any of these locations. Table 5-4 presents a summary of the barrier evaluation.

5.3.8 Land Use and Farmland

To mitigate for the conversion of wetlands and other open space to transportation use, NJTA proposes to create and maintain approximately 57 acres of wetlands and open water on land north and south of the proposed highway alignment, east of Haypress Road, and to preserve 202 acres of existing forested wetland and upland in the vicinity of Friendship Road and Miller Road (see Section 5.3.4 above).

Vegetative screening is proposed wherever feasible between Route 92 and existing land uses.

NJTA indicates that property acquisition required for the proposed Route 92 ROW and relocation of current occupants would be conducted in accordance with the New Jersey Relocation Act of 1971, as amended. Relocation assistance would be available to all displaced residents, businesses, and organizations.

Table 5-4
Noise Barrier Evaluation

OPTIMA Modeling Results [1]					**Receptor Data**	
Barrier Dimensions			**Cost**	**Max. Insertion Loss**	**No. of Benefited**	**Cost/Receptor**
height (ft)	length (ft)	area (ft2)	($)	(dB)	**Receptors**	($)
Receiver R-6 Sound Barrier						
10	600	6,000	120,000	7	1	120,000
Receiver R-13 Sound Barrier						
10	600	6,000	120,000	5	1	120,000
Receiver R-14 Sound Barrier						
10	600	6,000	120,000	5	1	120,000
Receiver R-16 Sound Barrier						
10	600	6,000	120,000	3	1	120,000
12	600	7,200	144,000	4	1	144,000
Receiver R-17 Sound Barrier						
10	600	6,000	120,000	3	1	120,000
12	600	7,200	144,000	4	1	144,000

Note: $20 per square foot of barrier was used as a cost estimation for evaluating cost effectiveness.

Three ball fields owned by Princeton University would be displaced by realignment of Research Way to accommodate the proposed interchange between Perrine Road and Route 92. NJTA and Princeton University have discussed the possibility of reconstructing the ball fields on adjacent land.

USACE will explore the feasibility of mitigation for loss of access to agricultural land with NJTA prior to making a permit decision.

5.3.9 Socioeconomics

Provision of emergency-only access to proposed Route 92 where it crosses Friendship Road would give the Monmouth Junction fire company and rescue squad access to Route 92 within two miles of their stations. This would reduce the difficulty of providing emergency services on the limited-access highway.

5.3.10 Transportation

Section 4.2.7 identified a potential undesirable impact of constructing proposed Route 92, namely an increase in the usage of Ridge Road/Heathcote Road between Route 27 and US Route 1 by trucks. In this EIS, "trucks" means vehicles with more than two axles or more than four wheels. A possible mitigation measure, if the proper approvals were secured, would be to restrict truck traffic on this section of Ridge Road/Heathcote Road to emergency vehicles and trucks making pickups and deliveries along Ridge Road. The Circulation Element of the Township of South Brunswick Master Plan anticipates restriction of truck traffic from Ridge Road west of US Route 1 after certain intersection improvements are complete. Assuming compliance with and enforcement of the truck restriction, trucks would divert to a variety of alternate routes, such as Raymond Road from US Route 1 to NJ Route 27. South Brunswick anticipates that after improvement of the intersection of US Route 1 and Route 522, Route 522 would provide a good alternative truck route between Route 27 and US Route 1.

In addition to truck traffic restrictions, traffic calming measures are another possible means to mitigate the traffic impact. Potential traffic calming measures include textured pavement, roadway narrowings, and speed humps or tables. Roadway narrowings may not be appropriate on Heathcote Road near the center of Kingston, where the roadway is already narrow, but could be used closer to US Route 1. The Kingston Volunteer Fire Company has objected to the idea of installing speed humps, but it may be that a type of speed hump or table could be installed that would not interfere with rapid response by emergency vehicles.

NJTA is open to contributing part of the cost of implementing truck restrictions and traffic calming measures on Ridge Road/Heathcote Road.

Figures 5-2 and 5-3 display the projected changes (with respect to the No Action alternative) in 2028 peak-hour truck volumes in the Traffic Study Area that would result from the construction of Route 92, if truck usage of Ridge Road/Heathcote Road were restricted. Comparison to Figures 4-1 and 4-2 shows that Ridge Road/Heathcote Road

Figure 5-2

2028 A.M.

Peak Hour Truck Volume Changes with Truck Prohibitions

Route 92 vs. No Action

US Army Corps of Engineers
Proposed Route 92
Environmental Impact Statement

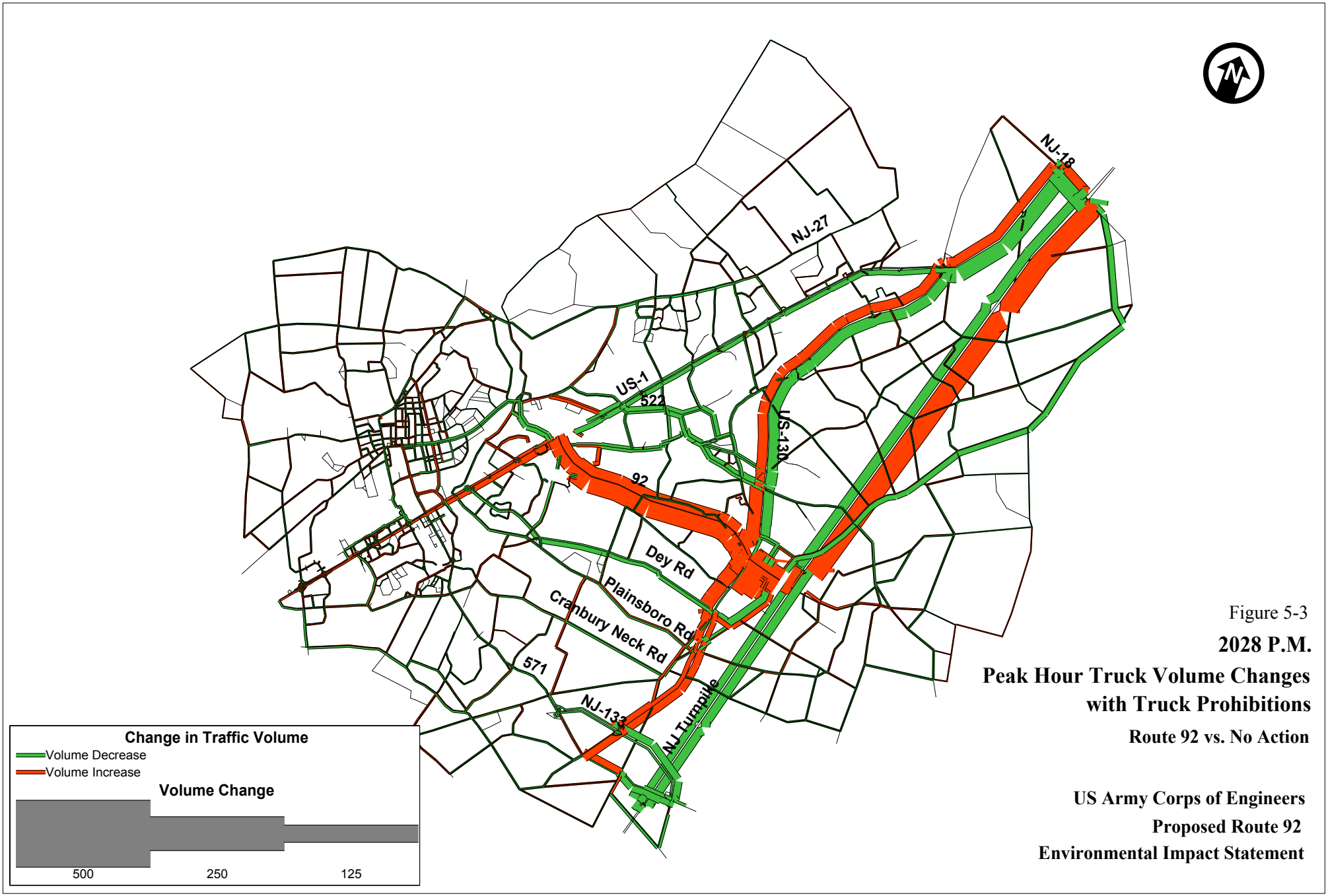

Figure 5-3

2028 P.M.

Peak Hour Truck Volume Changes with Truck Prohibitions

Route 92 vs. No Action

US Army Corps of Engineers
Proposed Route 92
Environmental Impact Statement

would be expected to see a decrease in traffic volume on both sides of the road, rather than the volume increase expected on westbound Ridge Road if no truck prohibition is enacted.

5.3.11 Air Quality

Newer equipment used by contractors constructing proposed Route 92 would have to comply with the federal emissions standards discussed in Section 4.2.6.2. For older pieces of equipment, NJTA would require contractors to add particulate filters and catalytic oxidizers as "after treatment" technologies on construction equipment. Filters are used to remove and burn particulate emissions. Catalysts for diesel engines are used for reducing NO_x and particulate emissions by converting them to less harmful compounds.

Measures recommended to mitigate impacts of fugitive dust include:

- Water or chemical dust suppressant spraying on exposed areas;
- Covering trucks hauling dust generating materials to and from the site;
- Washing wheels and underbodies of construction vehicles prior to departure from the site;
- Reducing vehicle flow over unpaved areas;
- Routinely cleaning paved areas to lessen the amount of dust available to be resuspended.

NJTA will be required to implement measures to ensure that the construction phase of the project meets the state and federal ambient air quality standards and does not exceed the NO_x de minimis level of 100 tpy. The specifications for the project will require that the contractor implement the following measures:

- Assemble a comprehensive inventory list (i.e. make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that will be used an aggregate of 40 or more hours during construction.
- Provide a plan demonstrating that the heavy-duty (equal to or greater than 50 horsepower) off-road equipment to be used during construction including owned, leased and subcontractor vehicles, will achieve a project-wide fleet-average 20 percent or greater NO_x reduction.
- Require use of engines equipped with post-combustion control technology, such as selective catalytic reduction units, NO_x absorbers or other applicable NO_x control technology, and require use of ultra-low-sulfur diesel fuel or low-emission alternative fuels.

- Ensure that all construction equipment is properly tuned and maintained.
- Minimize idling time to 10 minutes to save fuel and reduce emissions.
- Use existing power sources (e.g., power poles) or clean fuel generators rather than high emission generators.
- Develop a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes and provide a flag person to guide traffic and ensure safety at construction sites.

5.3.12 Aesthetics

Vegetative screening could be provided between proposed Route 92 and residences close to the highway.

Lighting associated with proposed Route 92 has not yet been designed. Pole-mounted area lighting is available that shines down but not to the side, reducing impacts beyond the area to be illuminated.

5.4 Route 1 Mitigation Actions

5.4.1 Acid-Producing Deposits

As there is the potential for acid-producing deposits to be present along the Route 1 Corridor between Northumberland Way and New Road, soil testing would need to be performed to determine whether or not these deposits exist. If it were determined that there are acid-producing deposits and that they would be exposed due to excavation, steps similar to those described in Section 5.3.1 would need to be taken to minimize the rate at which acid is produced.

5.4.2 Streams and Floodplains

The floodplains of Heathcote Brook and Oakeys Brook, as well as some of the tributaries to these streams, would be crossed if the US Route 1 Widening and Signal Removal alternative were implemented. As a result, any culverts, bridges, or other structures that would be added or modified within the floodplains would require mitigation similar to that described in Section 5.3.2. Minimization of fill within the floodplains would also be sought by regulatory agencies reviewing permit applications for this alternative.

5.4.3 Water Quality

NJDEP has issued a NJPDES permit to the New Jersey Department of Transportation for the state highway system, which includes US Route 1. The permit requires that runoff from US Route 1 comply with the New Jersey stormwater regulations at NJSA 7:8-5 (see Section 4.2.3.1). If the US Route 1 Widening and Signal Removal alternative were implemented, the existing stormwater management system would need to be upgraded

to be able to convey and manage the quality of the additional stormwater that would be generated by this alternative.

5.4.4 Wetlands

The US Route 1 Widening and Signal Removal alternative is estimated to impact a total of 7.7 acres of wetlands if implemented. Since forested wetlands typically require mitigation at a ratio of at least 2:1, a minimum of 15.4 acres of wetlands would have to be created as mitigation, or an alternative method of mitigation proposed. In addition, any wetlands temporarily impacted due to construction easements would need to be mitigated in-place at the end of construction.

5.4.5 Land Use

Acquisition of properties required for new US Route 1 interchanges and relocation of current occupants would need to be conducted in accordance with the New Jersey Relocation Act of 1971, as amended. Relocation assistance would need to be made available to all displaced residents, businesses, and organizations.

5.4.6 Socioeconomics

Gaps could be provided in the Jersey barriers dividing the northbound and southbound lanes of US Route 1 to allow emergency vehicles to make U-turns. This would mitigate the increase in response time caused by elimination of at-grade intersections.

Section 6
Public Involvement

6.1 Public Coordination

On February 26, 1999, the US Army Corps of Engineers New York District (USACE) issued a public notice of the NJTA Section 404 permit application for proposed Route 92. USACE held a public hearing on the application on March 29, 1999 in Plainsboro, New Jersey. After receipt of comments in response to the notice and at the public hearing, USACE determined that preparation of a federal Environmental Impact Statement (EIS) regarding the permit application was in order.

In the Federal Register of April 28, 2000, USACE published a notice of intent to prepare a draft EIS. The notice of intent encouraged interested parties to submit their names and addresses to the USACE contact for inclusion on the distribution list for the draft and final EIS and related public notices.

Written comments on the proposed scope of the EIS were accepted for 45 days following publication of the notice of intent. In addition, USACE held a public scoping meeting on June 8, 2000, at the Holiday Inn Princeton on US Route 1 at Ridge Road, near the western terminus of proposed Route 92. The public scoping meeting was announced at least 30 days in advance and was publicized through mailings and on the USACE New York District website.

At the public scoping meeting, USACE received oral and written comments on the proposed scope of the EIS. Commenters included officials from South Brunswick, Plainsboro, Franklin and Hopewell townships; residents of the area; and representatives of environmental and citizen groups, a construction laborers union, and a trucking organization.

The Draft Environmental Impact Statement was issued in April 2004. Notice of Availability and announcement of a public hearing was published in the Federal Register on April 20, 2004. A public hearing was held on May 20, 2004 and the hearing record was kept open until June 14, 2004 for the receipt of written comments.

Seventy-five speaker presentations at the public hearing, 37 tape recorded statements and 155 comment letters were submitted for the record, containing a total of approximately 1,300 comments on the Draft EIS. The comments and responses thereto are contained in the "Response to Comments" documents that are part of this Final EIS.

6.2 Permits/Legal Requirements

Construction of the proposed Route 92 highway requires a permit from USACE allowing filling of wetlands under Section 404 of the Clean Water Act (33 USC 1344). This permit is commonly called a "Section 404 permit." NJTA submitted an application for a Section 404 permit for proposed Route 92 on January 6, 1999. This EIS will assist

USACE in determining whether to issue a Section 404 permit for the project. The EIS process follows USACE procedures for implementing the National Environmental Policy Act (NEPA), 33 CFR parts 230 and 325.

NJTA originally submitted an application for a freshwater wetlands individual permit (FWIP) for proposed Route 92 to the New Jersey Department of Environmental Protection (NJDEP) in September 1996. On March 29, 1999, NJDEP issued a FWIP and Water Quality Certificate for proposed Route 92. That FWIP and Water Quality Certificate expired on March 29, 2004. NJTA submitted a new application on December 27, 2004. Under USACE regulations, no Section 404 permit can be granted until the required NJDEP water quality certification has been issued or waived.

Because implementation of proposed Route 92 would involve construction in flood plains, the project also requires a stream encroachment permit from NJDEP. NJTA originally submitted an application for a stream encroachment permit for proposed Route 92 on November 21, 1996. Six revisions and supplements to the application were submitted, the last of which was submitted on April 21, 1999. NJDEP did not act on that application. A new stream encroachment permit application was submitted on December 27, 2004.

The Freehold Soil Conservation District must certify the soil erosion and sediment control plan for proposed Route 92. The plan was submitted for certification on July 30, 1997 and was certified on April 6, 1998. The certification expired on October 6, 2001. The soil erosion and sediment control plan will have to be resubmitted for recertification.

The Delaware & Raritan Canal Commission certificate of approval for proposed Route 92 also has lapsed. Commission approval would be required prior to construction of Route 92. NJTA plans to submit a new application to the Commission if NJDEP issues permits for the project.

6.3 Cooperating Agencies

Federal

United States Environmental Protection Agency Region 2
United States Department of the Interior Fish and Wildlife Service

State

New Jersey Department of Transportation

Section 7
List of Preparers

The Route 92 EIS was prepared by CDM and its subcontractors under the direction of the U.S. Army Corps of Engineers New York District. The following personnel contributed to and assisted in the preparation of the document.

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Section 8
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GIS Figure References

Figure 1-1, Location Map:
County boundary, municipal boundary, major highway - NJDEP GIS data download (http://www.state.nj.us/dep/gis/).
Route 92 centerline - provided by DMJM+HARRIS, Inc. Iselin, New Jersey, in Auto CAD format.

Figure 1-4, Regional Road Network and Land Use Patterns:
County boundary, municipal boundary, streams - NJDEP GIS data (ARC/INFO format) available on CD ROM – 1998 update.
Street centerline – 2000 Census GIS data (E00 format)
County and state parks – GIS data (E00 format) from NJ Department of Community Affairs website (http://www.state.nj.us/osp/ospmaps3.htm)
Year 1995 Land Use/Land Cover – NJDEP GIS data download.

Figures 2-1, 2-2, 2-3, Alternatives Analysis:
Street centerline, major highway – Enhanced TIGER files (http://www.esri.com).
Alternatives lines – hand digitized.

Figure 3-1, Topography, Sheets 1 - 8:
Route 92 center line and impact corridor line - provided by DMJM+HARRIS, Inc. in Auto CAD format.
USGS monochromatic bitmap images: NJDEP GIS data download.

Figure 3-2, Geologic Formations:
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Water (polygon) - NJDEP GIS data download (land use coverage).
Geologic formations – NJ Geologic Survey data available on CD.

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Figure 3-4, Surface Water Features with Water Quality Monitoring Locations:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Route 1 impact corridor – hand digitized.
NJDEP watershed management area boundary - NJDEP GIS data.
USGS/NJDEP Water Quality Monitoring Locations – NJDEP GIS data download.
NJDEP Permit Sites: NJDEP GIS data download.

Figure 3-5, FEMA Flood Hazard Areas:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
FEMA 100 Year Flood Zone – 1996 FEMA Flood Mapping CD (E00 format files)

Figure 3-6, NJDEP Flood Hazard Areas:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data.
NJDEP Flood Hazard Areas – NJDEP 1998 GIS data on CD.
NJDEP Disclaimer for this map: This map was developed using NJDEP Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized. Actual floodplain locations are subject to field investigation, survey and assessment.

Figure 3-7, Bedrock Aquifers:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Bedrock aquifers - NJ Geologic Survey data available on CD.

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Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Bedrock aquifers - NJ Geologic Survey data available on CD.

Figure 3-9, Major Wetlands Systems in Route 92 Study Area:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
NJDEP Wetlands Delineation- 1995 Land Use/Land Cover, NJDEP GIS data download.

Figure 3-10, Major Wetlands Systems in Route 1 Study Area:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
NJDEP Wetlands Delineation- 1995 Land Use/Land Cover, NJDEP GIS data download.

Figure 3-11, Wetland Area Locations:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Wetland area – digitized from the 1994 DEIS prepared by Harris.

Figure 3-12, Study Area Habitat:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Study area habitats – digitized from the 1994 DEIS prepared by Harris.

Figure 3-13, Middlesex County Farmland Preservation Program:
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Municipal boundary, county boundary – NJDEP GIS data download.
Farmland preservation program coverages – Middlesex County Planning Department.

Figure 3-20, Noise Monitoring and Modeling Locations, Sheets 1 – 3:
Route 92 centerline, impact corridor and surrounding features – Auto CAD drawing provided by DMJM+HARRIS, Inc.

Figure 3-21, Prior Noise Monitoring Locations:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Noise monitoring locations - digitized from the 1994 DEIS prepared by Harris.

Figure 3-22, Known Contaminated Sites:
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Known contaminated sites – NJDEP GIS data download (KCS 2001 update).

Figures 3-23a and 3-23b, Land Use (Route 92 and Route 1 corridors):
Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
Municipal boundary, county boundary – NJDEP GIS data download.
Land use – NJDEP 1995 land use coverage.

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Street centerline, major highway, PSE&G, railroad, hydrologic feature – Enhanced TIGER files.
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Zoning – digitized from Plainsboro, South Brunswick, and North Brunswick Townships zoning maps.

Figure 3-25, Minority Status for Blocks in Route 92 Corridor:
United States Bureau of the Census, 2000 Census of Population and Housing