FINAL ENVIRONMENTAL IMPACT STATEMENT FOR LAURELWOOD HOUSING AREA ACCESS

Naval Weapons Station Earle
Colts Neck, New Jersey

April 2009



Prepared for:

Contract No. N62472-01-D-1390

VOLUME 1 OF 2

Final Environmental Impact Statement
For Laurelwood Housing Area Access at Naval Weapons Station Earle, New Jersey

Lead Agency for the EIS:	United States Department of the Navy
Cooperating Agencies:	No cooperating agencies have been identified.
Title of the Proposed Action:	Laurelwood Housing Area Access Environmental Impact Statement (EIS)
Proposed Action:	Provide unimpeded access between the Laurelwood housing area at Naval Weapons Station Earle and an adjacent state primary or secondary road
Designation:	Final Environmental Impact Statement

Abstract: This Final Environmental Impact Statement (FEIS) has been prepared by the United States (U.S.) Department of the Navy in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.); the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Chief of Naval Operations (CNO) Instruction 5090.1C *Environmental and Natural Resource Program Manual*. The proposed action evaluated in this FEIS is the provision of unimpeded access between the Laurelwood housing area at mainside Naval Weapons Station (NWS) Earle and an adjacent state primary or secondary road. The purpose and need for the action is to satisfy the contractual obligation of a lease agreement for the Laurelwood housing area between the U.S. Navy (lessor) and the private developer (lessee) of the housing area. The Navy intends to satisfy this obligation by providing an easement for access adequate to allow the developer to construct a road from New Jersey Route 34 to the Laurelwood housing area. The action alternatives include four alignments that provide dedicated access to Laurelwood via new entrances on Route 34. The selected alternative alignment route and the Laurelwood housing area would be securely separated from the functioning installation. The No Action Alternative is also evaluated. Implementation of the proposed action is planned to take place prior to the end of April 2010 pursuant to the lease agreement. This FEIS addresses potential environmental impacts from activities that would occur under the No Action Alternative and the four action alternatives. Environmental resource topics evaluated include land use, socioeconomics, community facilities and services, infrastructure/utilities, traffic, air quality, noise, cultural resources, earth resources, biological resources, environmental health and safety, environmental justice, and security.

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EXECUTIVE SUMMARY

The United States Department of the Navy (U.S. Navy) is proposing to provide unimpeded access between the Laurelwood housing area at mainside Naval Weapons Station (NWS) Earle and an adjacent state primary or secondary road pursuant to a lease agreement between the Navy and the developer of the Laurelwood housing area (developer). Naval Weapons Station Earle is an 11,035-acre facility located entirely within Monmouth County, New Jersey. The installation is comprised of two separate land holdings connected by a 14-mile road and rail line. Mainside is located adjacent to the intersection of Route 34 and Route 18 and is located within portions of Colts Neck Township, Tinton Falls Borough, Howell Township, and Wall Township. The waterfront site is located on Sandy Hook Bay along the Atlantic Ocean in Leonardo, New Jersey. All housing associated with NWS Earle is located at mainside. The Naval Munitions Command, CONUS East Division Detachment Earle performs the station's primary mission—providing ammunition to the Fleet.

The Navy is the lead agency for the proposed action. No cooperating agencies have been identified. This Environmental Impact Statement (EIS) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.); the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Chief of Naval Operations Instruction 5090.1C *Environmental and Natural Resource Program Manual*.

ES.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose for the action is to provide unimpeded access between the Laurelwood housing area at mainside NWS Earle and an adjacent state primary or secondary road subject to applicable federal, state, and local laws and regulations. The need for the action is to satisfy the contractual obligation of a lease agreement for the Laurelwood housing area between the Navy (lessor) and a private developer (lessee).

In 1988 the Navy contracted with a developer to construct, own, and operate 300 military family housing units at NWS Earle, now known as the Laurelwood housing area. At that time, the 300 units were necessary to satisfy a need for additional military housing for personnel associated with Fast Combat Support ships homeported at NWS Earle. A 52-year lease agreement for the underlying land was executed between the Navy and the developer which included an in-lease and an out-lease period. During the in-lease period, which runs from 1988 until 2010, the Navy guarantees rent payments to the developer for the occupancy of all 300 Laurelwood units. Only military personnel and their dependents are allowed to occupy these housing units during the in-lease period. The out-lease period runs from 2010 until 2040. During the out-lease period the Navy no longer rents housing units at the Laurelwood housing area and the developer may rent units to the general public. Specific citations of the lease agreement (U.S. Navy 1988a) relevant to the purpose and need follow below:

> Part I, paragraph D., page 2 – Use: "Upon the termination of the Inlease, the Lessee shall have the right to lease the housing constructed for the Government to members of the general public of

> Lessee's own choosing and to set rental rates and other terms of occupancy consistent with applicable laws and regulations."
>
> Exhibit A of the in-lease stipulates that " . . . reasonable access shall be granted."
>
> Paragraph 15 of Supplemental Lease Agreement 43: "Reasonable access is defined as being on a paved road, constructed, operated and maintained by Lessee at its own cost, on such access, pursuant to state, county and township specification at time of construction."
>
> "The Government and Lessee agree and acknowledge that the Government may satisfy such obligation by either (a) providing unimpeded access or (b) providing an easement for alternate access adequate to allow Lessee to construct a road from a Highway to the Leased Property that will provide unimpeded access (the "New Access Road"). As used herein, "unimpeded access" shall mean that the Government will impose no access requirements to residents or the public to obtain access to the Leased Property beyond those generally imposed in similar private residential developments."

Paragraph 15 of Supplemental Lease Agreement 43 defines the responsibilities assigned to the Navy and the developer regarding the provision of reasonable access:

> "The Government shall be responsible for the costs associated with obtaining all necessary permits and approvals, including but not limited to any initial and ongoing mitigation efforts, if any, and Lessee shall be responsible only for the direct construction costs associated with building and maintaining the New Access Road as soon as all necessary permits and approvals are obtained . . ."

In 2040, the lease agreement expires and the developer is obligated to demolish the 300 housing units.

> Outlease, Part I, G: "Lessee shall within sixty (60) days after expiration or prior termination of this lease . . . remove all buildings, structures, fixtures and other improvements constructed or placed on the Leased Property . . . After Lessee removes all buildings, structures, fixtures and other improvements, Lessee shall restore the property at the expiration of this lease."

ES.2 DESCRIPTION OF THE PROPOSED ACTION

The proposed action being evaluated in this EIS is the provision of unimpeded access between the Laurelwood housing area at mainside NWS Earle and an adjacent state primary or secondary road. Under the proposed action, the Navy would provide an easement for access adequate to allow the developer to construct a road from New Jersey Route 34 to the Laurelwood housing area that will provide unimpeded access. The selected alternative alignment route and the Laurelwood housing area would be securely separated from the functioning installation.

ES.3 ALTERNATIVES IDENTIFICATION

The Navy initiated a planning process in 2002 to identify any conceivable alignment that might satisfy the conditions of the lease agreement. At the end of a 3-year planning process, the Navy had identified 18 different alignments to consider (U.S. Navy 2002b, 2003b, 2005). Of the 18 alignments, 8 were designed to access NWS Earle using the main gate. Three alignments involve use of property that is owned by the Navy and leased to the Colts Neck Township for the

Township's school bus parking and storage facility. One alignment requires construction of a new intersection on Route 18 that connects directly with the Laurelwood housing area. Two alignments involve the use of Normandy Road near Route 18. Three alignments require the construction of new intersections to Route 34 near the Green Drive housing area. One alignment requires the construction of a new intersection on Route 34 approximately 1,750 feet south of the main gate.

Consistent with NEPA, this EIS evaluates a reasonable range of practicable alternatives that meet the purpose and need of the proposed action. In addition to meeting the purpose and need, there are other requirements that a particular alignment must meet in order to be a practicable alternative to the proposed action. These requirements are briefly described below in the form of screening criteria. Each of the 18 identified alignments has been evaluated against each of these criteria. If an alignment failed to satisfy any one criterion, then that alignment was not considered a practicable alternative and was eliminated from further consideration in this EIS.

- Criterion 1: Meets the contractual obligations of the lease agreement between the Navy and the developer
- Criterion 2: Tenable and safe access to adjacent public roads
- Criterion 3: Does not compromise NWS Earle security
- Criterion 4: Does not affect the ability of NWS Earle to maintain acceptable operational/mission capability

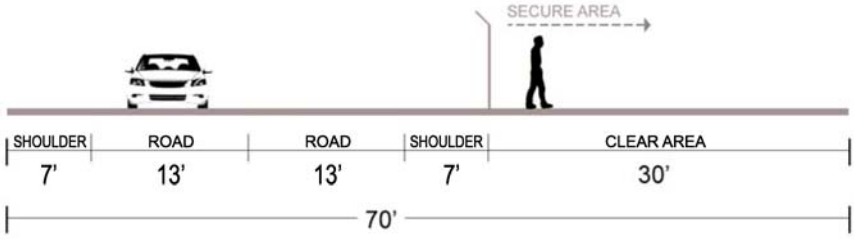
Section 2.4.1 provides a summary and rationale for the elimination of 14 out of 18 potential alignments from further consideration in this EIS using screening criteria defined in Table 2-3. The remaining four potential alignments, briefly summarized in Table 2-2, include the three "Route 34 North of the Main Gate" alignments and the "Route 34 South of the Main Gate" alignment. These four alignments meet the screening criteria and will be evaluated in selecting the preferred alternative. In addition to the four action alternatives, the No Action Alternative also will be evaluated. The following sections provide details about each of the alternatives, which have been renamed as Alternative Alignments 1, 2, 3, 4, and the No Action Alternative.

ES.4 DESCRIPTION OF ALTERNATIVES

ES.4.1 Alternative Alignment 1

Alternative Alignment 1 would access NWS Earle via a new entrance approximately 2,112 feet to the north of the main gate along Route 34 (Figure 2-1 on Page 2-9). This alignment measures approximately 3,379 feet from the Route 34 entrance to the Laurelwood and Stark Road housing areas. The alignment would require approximately 1,837 linear feet (LF) of new pavement and approximately 10,373 LF of new perimeter fence. The alignment would also require approximately 1,003 LF of road improvement to upgrade the access road to New Jersey standards for a residential highway.

The right-of-way for new road construction is assumed to be 70 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of one shoulder. A 30-foot clear area for security would be located outside the fence line within NWS Earle boundaries.



From the new entrance on Route 34, Alternative Alignment 1 would cross approximately 508 feet of wooded area before intersecting with an existing sand road at the end of Green Drive. The alignment would continue east on the existing sand road for approximately 161 feet before crossing approximately 792 feet of wooded area and sand fields associated with a wastewater treatment plant. The alignment would then intersect with an existing paved road. A treated water outfall pipe is located at the point where the road through the sand fields intersects with the existing pavement.

It is expected that the pipe and the oxygenation tank on the east side of the existing road would need to be relocated south of the alignment. The alignment would continue northeast for approximately 528 feet until crossing a one-lane bridge over Hockhockson Brook. The bridge would be expanded to two lanes in order to accommodate expected traffic from the Laurelwood and Stark Road housing areas. From the bridge, the alignment would continue southeast for approximately 508 feet to intersect with Saipan Road. From this intersection the alignment would continue east on Saipan Road to reach the Laurelwood and Stark Road housing areas.

New Jersey Department of Transportation (NJDOT) indicated that this alignment would be acceptable as a "right-in, right-out" access working in concert with the existing loop ramps at the Route 18 interchange, and a potential new jughandle ramp at the existing Esperance Road traffic signal (NJDOT 2007). This ingress/egress concept is illustrated on Figure 2-2 on Page 2-11. The requirement for a "right-in, right-out" access is due to the proximity of the proposed entrance to the Route 18 interchange. A median barrier is recommended between the Main Gate north to the acceleration/deceleration lanes at the Route 18/Route 34 interchange to prohibit left turns and u-turns out of the new entrance. Route 18 ramps would be used to accommodate the left turn movements which would not be permitted at the new intersection. Acceleration and deceleration lanes on northbound Route 34 will likely be required pursuant to NJDOT design standards.

Security fencing would be installed along the south side of the entire length of the access road including the southern perimeter of the Laurelwood housing area. The community facilities located adjacent to Laurelwood/Stark Road would be located outside (south of) this fence line and be accessible to Navy personnel and their dependents. However, the existing driveway for the community facility along Stark Road would be eliminated; only the community facility along

Macassar Road would have access from on-base. The Navy would need to provide access to both facilities. Provision of this access is not part of the proposed action evaluated in this EIS. The Navy would comply with all applicable laws and regulations prior to implementing the community facility access.

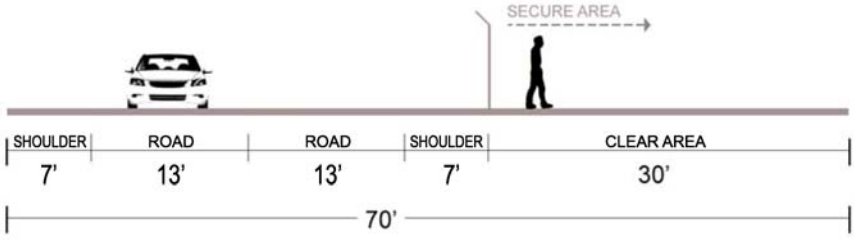
Fencing would be constructed in accordance with accepted security standards for the installation. The fencing would essentially fence off the northern portion of the installation by connecting to the perimeter fence at Route 34 and at Route 18 on the north side of the Laurelwood housing area through an existing cleared sand road to the perimeter fence. Because of this security fencing requirement, the residents of Stark Road would be required to use this new entrance and access road to enter and exit the installation.

Two perimeter emergency access points would be installed along the alignment to allow emergency vehicles access to the housing area and the eastern portion of the perimeter road on the north side of the installation. Access could be controlled using a remote control or a security code.

ES.4.2 Alternative Alignment 2

Alternative Alignment 2 would access NWS Earle via a new entrance approximately 1,200 feet to the north of the main gate along Route 34 (Figure 2-3 on Page 2-13). This alignment measures approximately 3,590 feet from the Route 34 entrance to the Laurelwood and Stark Road housing areas. The alignment would require approximately 1,531 LF of new pavement and approximately 11,813 LF of new perimeter fence. The alignment would also require approximately 1,003 LF of road improvement to upgrade the access road to New Jersey standards for a residential highway.

The right-of-way for new road construction is assumed to be 70 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of one shoulder. A 30-foot clear area for security would be located outside the fence line within NWS Earle boundaries.



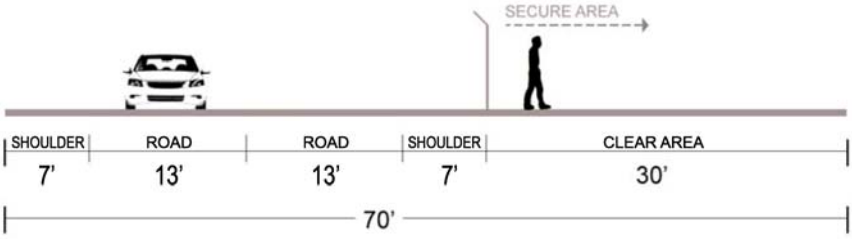
From the new entrance on Route 34 Alignment 2 would cross approximately 195 feet of wooded area before intersecting with Gela Road. The alignment would then follow Gela Road east until intersecting with Green Drive. The alignment would pass by each of the Officer housing units along Gela Road and Green Drive. The alignment would then follow Green Drive north to the end of the cul-de-sac and turn east onto an existing sand road. The sand road crosses a culvert carrying a tributary of Hockhockson Brook. From this point, Alternative Alignment 2 follows the same route to reach the Laurelwood housing area as described for Alternative Alignment 1.

Security fencing and perimeter emergency access points would be similar to that described for Alternative Alignment 1, except that security fencing would be installed along the south side of the entire length of the access road including the south/southeast side of the Green Drive housing area. Because of this security fencing requirement, the residents of Green Drive and Stark Road would be required to use this new entrance and access road to enter and exit the installation.

A traffic signal would be installed at Route 34 and the proposed alignment entrance in order to provide acceptable levels of service. The following intersection configuration is assumed: Northbound—one through lane and one right-turn lane; Southbound—one through lane and one left-turn lane; Westbound (site exit)—one left-turn lane and one right-turn lane. The northbound Route 34 approach may be widened to provide a dedicated right-turn lane. In addition, the westbound Esperance Road approach may be modified to provide two turning lanes, though it appears this can be accomplished with restriping and only minimal widening.

ES.4.3 Alternative Alignment 3

Alternative Alignment 3 would access NWS Earle via a new entrance approximately 1,200 feet to the north of the main gate along Route 34 (Figure 2-4 on Page 2-16). This alignment measures approximately 3,960 feet from the Route 34 entrance to the Laurelwood and Stark Road housing areas. The alignment would require approximately 195 LF of new pavement and approximately 11,038 LF of perimeter fence. The alignment would also require approximately 3,221 LF of road improvement to upgrade the access road to New Jersey standards for a residential roadway. The right-of-way for new road construction is assumed to be 70 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of one shoulder. A 30-foot clear area for security would be located outside the fence line within NWS Earle boundaries.



Alternative Alignment 3 would cross approximately 195 feet of wooded area before intersecting with Gela Road. The alignment would then follow Gela Road east, passing the intersection with Green Drive. The alignment would pass by one Officer housing unit on Gela Road.

The alignment would follow Gela Road for approximately 634 feet, passing by two NWS Earle buildings inside the fence line (Buildings C-4 and C-27).

The alignment would continue northeast for approximately 2,059 feet, following the existing road around the wastewater treatment plant, and crossing a one-lane bridge over Hockhockson Brook. From this point, Alternative Alignment 3 follows the same route to reach the Laurelwood housing area as described for Alternative Alignments 1 and 2.

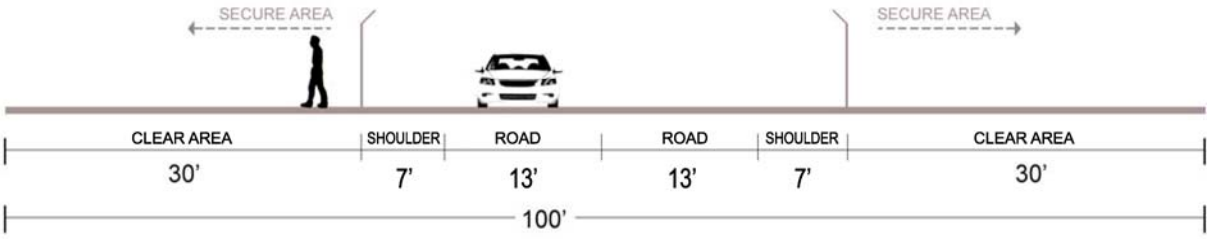
Security fencing and perimeter emergency access points would be similar to that described for Alternative Alignments 1 and 2, except that security fencing would include the south side of Gela Road as well as Buildings C-4, C-27, and the wastewater treatment plant. Access to Buildings C-4, C-27, and the wastewater treatment plant would be through the new entrance on Route 34 or through a perimeter emergency access point.

Road and intersection design requirements would be the same as those required for Alternative Alignment 2. However, the portion of existing paved road between Gela Road and the intersection with Saipan Road would need to be widened and upgraded to accommodate the additional traffic volumes estimated with this alignment.

ES.4.4 Alternative Alignment 4

Alternative Alignment 4 would access NWS Earle via a new entrance approximately 1,742 feet to the south of the main gate along Route 34 (Figure 2-5 on Page 2-18). This alignment measures approximately 7,181 feet from the Route 34 entrance to the Laurelwood housing area.

The alignment would require approximately 3,900 LF of new pavement and approximately 21,897 LF of perimeter fence. The right-of-way for new road construction is assumed to be 100 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of the shoulders. Two 30-foot clear areas for security would be located outside the fence line within NWS Earle boundaries.



Alternative Alignment 4 would cross approximately 50 feet of wooded area to connect with an existing sand road. The alignment would continue east on an existing sand road for approximately 1,742 feet and through approximately 200 feet of wooded area before intersecting with Lake Earle Road. The alignment continues northbound another 2,112 feet on Lake Earle Road to intersect with Esperance Road. Laurelwood traffic would access Macassar Road using a new two-lane bridge/overpass over Esperance Road. After crossing Esperance Road, traffic would continue northbound on Macassar Road approximately 3,170 feet to intersect with the railroad crossing and then into the Laurelwood housing area.

Security fencing would be installed along both sides of the entire length of the access road, including Macassar Road and the perimeter of the Laurelwood housing area. Four perimeter emergency access points would be installed along the fence line between the Route 34 entrance and Lake Earle Road to allow fire/rescue personnel and security personnel access to the adjacent open space beyond the fence line. A perimeter emergency access point would be installed at the

intersection of Stark Road and Macassar Road to allow emergency vehicles access to Laurelwood. As with Alignments 1, 2, and 3 access could be controlled using a remote control or a security code. Because this intersection would be closed except to allow security and fire/rescue personnel access to Laurelwood, a new access point to the community center along Macassar Road would be required. Provision of this access is not part of the proposed action evaluated in this EIS. The Navy would comply with all applicable laws and regulations prior to implementing the community facility access.

A full movement unsignalized intersection is proposed at Route 34 for Alternative Alignment 4. The following intersection configuration is assumed: Route 34 Northbound—dedicated right-turn lane and acceleration and deceleration lanes; Route 34 Southbound—dedicated left-turn lane; Westbound (site exit)—dedicated left-turn lane and right-turn lane.

ES.4.5 No Action Alternative

The No Action Alternative maintains the status quo at NWS Earle. Under this alternative, an easement would not be provided to the developer of Laurelwood and an access road would not be constructed. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The Navy would be in breach of the lease agreement if unimpeded access is not provided at the termination of the in-lease period. Under this circumstance, the Navy would terminate the lease and compensate the developer in an amount equal to the developer's right to use or occupy the Laurelwood housing area for what would have been the remaining useful life of the housing (U.S. Navy 1988a).

The No Action Alternative is not a feasible alternative to the proposed action because it does not meet the purpose and need. Nevertheless, Council on Environmental Quality regulations implementing NEPA (40 CFR 1500-1508) require that the No Action Alternative be carried forward for analysis in the EIS.

ES.4.6 Preferred Alternative

Section 1502.14(e) of the CEQ regulations implementing NEPA requires that if an agency has a preferred alternative, that alternative should be identified in the EIS. After careful consideration of the potential impacts of the alternatives evaluated in this EIS in Chapter 4, the Navy has selected Alternative Alignment 4 as the preferred alternative.

In comparison to the other alternatives for meeting the purpose and need, implementation of Alternative Alignment 4 would result in the least impact to the operational capability of NWS Earle. Furthermore, Alternative Alignment 4 would not adversely affect the ability of NWS Earle personnel to effectively conduct daily operations and execute the installation's mission. Of the four alternatives considered in this EIS, only Alternative Alignment 4 allows existing military family housing areas and other facilities to remain within the secure fence line of the installation while also providing secure access for civilians to the Laurelwood housing area. Unlike the other three alternatives evaluated in this EIS, Alternative Alignment 4 would not separate military family housing and other facilities from the rest of the base by a new security fence.

Implementation of any of the four alternative alignments requires an access permit from the New Jersey Department of Transportation (NJDOT). Through written correspondence between the Navy and NJDOT representatives, the NJDOT identified Alternative Alignment 4 as their preferred alternative for access to Route 34. This is primarily due to the Alternative Alignment 4 intersection being located farthest from the Route 34/Route 18 interchange.

Alternative Alignment 4 would result in the least amount of permanent impact to wetlands and wetland transition areas. Alternative Alignment 4 does not impact architectural or archaeological resources. In-water construction would not be required for this alternative; therefore, impacts to Hockhockson Brook and its tributaries would not occur.

ES.5 PUBLIC INVOLVEMENT AND SCOPING

NEPA regulations require an early and open process for determining the scope of issues that should be addressed prior to implementation of a proposed action. The Navy initiated the public scoping process on November 9, 2007, by publishing a Notice of Intent (NOI) to prepare an EIS in the *Federal Register*, and sending copies of the NOI to federal, state, and local agencies, and other parties known or expected to be concerned about the proposed action.

A public scoping meeting was held on November 27, 2007 at Brookdale Community College located at 765 Newman Springs Road, Lincroft, New Jersey in Monmouth County between 4:00 PM and 8:00 PM. Comments from the public scoping meeting as well as written comments received in response to the published NOI have been considered during development of the Draft EIS (DEIS).

The Notice of Availability of the DEIS was published in the *Federal Register* on November 28, 2008, marking the beginning of the public comment period. A public hearing and open house session was held on December 16, 2008 at the Performing Arts Center of the Monmouth Regional High School in Tinton Falls, New Jersey. The open house session was held from 4:00 PM to 5:30 PM where attendees could discuss the EIS with Navy representatives. The public hearing took place between 6:00 PM and 10:00 PM. The purpose of the meeting was to receive oral and written comments on the DEIS. Comments received at the public hearing and throughout the formal comment period have been addressed in Volume II of the Final EIS. The formal comment period was extended to January 23, 2009 at the request of several members of the public.

The issues raised during the public scoping period and DEIS comment period are categorized by issue and summarized below.

Alternatives
(Section 2.0)

- Evaluate a buy out of the developer.
- Restrict Laurelwood housing area to senior housing; homeless; disabled; or veterans.
- Action alternatives should include payments to build necessary community infrastructure (e.g., schools, etc.).
- Stagger occupation of Laurelwood housing area.

Security
(Sections 3.13 and 4.13)

- Concern about security/safety of local residents as well as military families living nearby.
- Concern over specific security measures that would be implemented.

Natural Resources
(Sections 3.10, 3.11, 4.10, and 4.11)

- Impacts to wetlands.
- Impacts to rare, threatened, and endangered species on NWS Earle.
- Impacts to aquifer.

Socioeconomics
(Sections 3.2 and 4.2)

- Additional tax burden on citizens.
- Relationship between NWS Earle and communities would be adversely impacted.
- Affordable housing needs in the local community.
- Fiscal and social impacts on military personnel.

Traffic
(Sections 3.5 and 4.5)

- Traffic impacts to local roads, including Route 18, Route 34, Colts Neck Road.

Cultural Resources
(Sections 3.8 and 4.8)

- Potential impacts to archaeological resources.

Community Facilities and Services
(Sections 3.3 and 4.3)

- Concern about overcrowding school infrastructure as well as class sizes and teacher resources.
- Concern about loss of funding for school programs to pay for education of additional students.
- Concern that quality of education would decrease.
- Diversity of students in school system would be beneficial to community.
- Concerns over amount of Federal Impact Aid payments.
- Potential burden on police and fire/rescue resources of the community.

Utilities
(Sections 3.4 and 4.4)

- Impacts to potable water supply.
- Concerns over solid waste disposal.
- Concerns over wastewater treatment.

Land Use
(Sections 3.1 and 4.1)

- Laurelwood housing area does not fit with the local community culture and zoning.
- Impacts to rural character of Colts Neck.

Environmental Health and Safety
(Sections 3.12 and 4.12)

- Potential impacts to potable water from contaminated sites at NWS Earle.
- Presence of munitions stored at NWS Earle and safety of residents.
- Presence of installation restoration sites at NWS Earle in the vicinity of housing area.

ES.6 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Environmental impacts on the following resources are evaluated in this EIS: land use, socioeconomics, community services and facilities, utilities, traffic, air quality, noise, cultural resources, geology, topography, and soils, biological resources, water resources and wetlands, environmental health and safety, and security. The environmental impact of implementing each alternative was evaluated against the baseline. A detailed discussion of the environmental consequences for each resource area is provided in Chapter 4.

ES.6.1 Land Use

Implementing Alternative Alignments 1, 2, or 3 would result in minor effects to land use at the Green Drive and Stark Road housing areas. Functionality would decrease relative to the other portions of the base. Furthermore, the secluded, residential land use character of the Green Drive community would be affected. Potential mitigation to offset the minor effect at Green Drive could involve planting screening vegetation, with a preference given to native vegetation when possible, to create a natural barrier between the new road and existing housing units. Under Alternative Alignment 3, Buildings C-27, C-4, and the wastewater treatment plant would be located outside the fence line, reducing their functionality with the administrative and support facilities at mainside. No appreciable effects are anticipated from Alternative Alignment 4.

No impacts to land use would occur under the No Action Alternative.

ES.6.2 Socioeconomics

The construction activity associated with the development of unimpeded access to the Laurelwood housing area would result in a short-term and temporary influx of jobs and expenditures in the area. The total regional economic impact of Alternative Alignment 1 would be $7.126 million in industry output, an estimated total of 50.2 full- or part-time temporary wage or salary jobs, and $4.182 million in value-added economic impact. The total regional economic impact of Alternative Alignment 2 would be $8.723 million in industry output, an estimated total of 61.5 full- or part-time temporary wage or salary jobs, and $5.120 million in value-added economic impact. The total regional economic impact of Alternative Alignment 3 would be $6.490 million in industry output, an estimated total of 45.7 full- or part-time temporary wage or salary jobs, and $3.809 million in value-added economic impact. The total regional economic impact of Alternative Alignment 4 would be $16.406 million in industry output, an estimated total of 115.6 full- or part-time temporary wage or salary jobs, and $9.629 million in value-added economic impact (Minnesota IMPLAN Group 2004a).

Over the long term, civilian residents of Laurelwood would purchase goods and services in the community, resulting in beneficial impacts to nearby retailers and services purveyors. Under the proposed action, the Laurelwood housing area population (assuming 100 percent occupancy) would be 853 persons, a 7.4 percent increase in the 2006 Colts Neck Township population. It is expected that some future residents of Laurelwood may already be located in Colts Neck. Given the relative stability of the Colts Neck population, this influx would not result in secondary changes in demographics or residency.

Civilians residing at Laurelwood housing area would be adjacent to military families living in the Stark Road housing area under Alternative Alignments 1, 2, and 3. Civilian residents would interact with others living and working at NWS Earle, as well as other citizens of Colts Neck and Tinton Falls. Military housing communities are unique in their cohesiveness built by the commonality of experience with one or more family members being in the service, use of on-station community support facilities, and participation in military family activities and events.

The civilian Laurelwood housing area residents would likely have less community cohesion and interaction, at least initially. If renters become long-term renters, however, there could be a different type of community cohesion built through long-term residence in the area, a quality that many military communities are lacking. Due to their proximity, there would be new interactions among civilian and military families, particularly those at Stark Road housing area under Alternative Alignments 1, 2, and 3.

No impacts to socioeconomics would occur under the No Action Alternative.

ES.6.3 Community Facilities and Services

Significant impacts from implementation of the proposed action, regardless of which alternative is selected, are anticipated at the Mahala F. Atchison Elementary School, the Swimming River Elementary School, and the Tinton Falls Middle School as a result of increased number of school-age children being sent to these schools under the proposed action. Specific impacts include physical capacity impacts, class size increases, additional school bus costs, and the potential need for additional faculty. Mitigation could include additional Federal Impact Aid funding from the U.S. Department of Education or redistricting of students. Redistricting could occur within a particular district, or agreements could be put in place between districts to distribute children into schools that have adequate capacity. No significant impacts to law enforcement, fire and medical services, or recreation resources in the region of influence are anticipated. Naval Weapons Station Earle would alter manpower and equipment levels as necessary to continue providing existing levels of service. The increased use of recreation facilities in the local community due to the influx of civilians at the Laurelwood housing area is expected to be minor and widely dispersed among the multitude of recreation opportunities available in the area.

No impacts to community facilities and services would occur under the No Action Alternative.

ES.6.4 Utilities

Utility demand would increase over existing levels at NWS Earle under the proposed action, regardless of which alternative is selected; however, no significant impacts to the provision of utilities are anticipated. Since the Laurelwood housing units have been mostly unoccupied for several years, minor upgrades to infrastructure may be required. Required upgrades would be determined based on inspection of specific infrastructure. The proposed action would result in a net increase in impervious surfaces due to construction of the access road to the Laurelwood housing area. These increases vary between the four alternatives. The net increase in impervious surfaces would result in an associated increase in stormwater discharge volumes and intensities. These impacts are expected to be offset by existing adequate stormwater discharge infrastructure at the installation. If additional stormwater management controls are necessary to mitigate any potential impacts downstream of the project, these controls would be designed and sited in accordance with all permit requirements and would avoid and minimize impacts to wetlands and other sensitive areas to the extent practicable. The proposed action would improve wastewater treatment infrastructure and potable water infrastructure at the installation as increased flow

would improve the efficiency of the treatment plant by increasing throughput volume, which improves the functioning of the system processes. Similarly, increased throughput volume of potable water would reduce the potential for elevated trihalomethane levels in the water.

No impacts to utilities would occur under the No Action Alternative. However, if the No Action Alternative is implemented the potable water distribution system and wastewater treatment system at NWS Earle would continue to function at less than optimal levels.

ES.6.5 Traffic and Transportation

The proposed action would result in localized, short-term on-station impacts to traffic from construction activities. During the period of effect, action would be taken to offset this impact by notifying the NWS Earle population about detours and delays as appropriate. Minor impacts to Stark Road residents (under Alternatives 1, 2, and 3) and Green Drive residents (under Alternatives 2 and 3) would result from additional vehicle trips associated with the Laurelwood housing area. Vehicle speeds would be limited to 25 miles per hour and focused within the morning and peak hours.

The proposed action would have a minor impact on the Route 34 and Colts Neck Road intersection, which experiences significant delays. However, the traffic associated with the proposed action would only represent between one and two percent of the overall volume at that intersection. Construction is required to the west side of the Route 34 and Main Gate intersection to accommodate the proposed new jughandle for Alternative Alignment 1. Under Alternative Alignments 2 and 3, a moderate impact is expected in the form of a slight degradation in the existing level of service for the northbound Route 34 approach to the alignment entrance. This impact could be offset through an adjustment to the signal timing at the Route 34/Esperance Road traffic signal. Under Alternative Alignment 4, a minor impact is expected in the form of delays at the intersection of Route 34 and Esperance Road. This impact could be offset by a dedicated northbound right-turn lane, and separate left- and right-turning lanes.

No impacts to traffic would occur under the No Action Alternative.

ES.6.6 Air Quality

There would be short-term construction-related air emission increases under the proposed action. Estimates for air emissions vary for each alternative, however, these emission levels would be insignificant. Therefore, there is no action to offset these impacts.

No impacts to air quality would occur under the No Action Alternative.

ES.6.7 Noise

Minor, short-term noise impacts would result from the construction activities associated with the proposed action, regardless of which alternative is selected. To offset these impacts, construction would generally occur during daylight hours and not into the sensitive nighttime hours or on weekends. Furthermore, sound levels could be reduced through the use of equipment sound

mufflers. Minor indirect impacts due to traffic noise associated with additional vehicle trips generated to and from the Laurelwood housing area are expected. This traffic would be residential with a speed limit of 25 miles per hour, thereby minimizing the effect to identified receptors.

No impacts from noise would occur under the No Action Alternative.

ES.6.8 Cultural Resources

Three housing units and their associated garages are eligible for the NRHP and are located within the vicinity of Alternative Alignments 2 and 3. Archaeological sites/features or isolated artifacts were encountered during studies conducted in October 2007 and February 2008 in the vicinity of each of the four alternatives. The Navy completed consultation with the New Jersey SHPO to determine whether any of these findings are eligible for listing on the NRHP. In a letter dated January 23, 2009, the SHPO concluded that none of these sites were eligible and there would be no effect to archaeological resources and/or historic properties from the proposed action. Therefore, selecting any of the proposed alternatives would result in no effect to cultural resources.

No impacts to cultural resources would occur under the No Action Alternative.

ES.6.9 Geology, Topography, and Soils

Impacts to geology, topography, and soils from the proposed action, regardless of which alternative is selected, would be minor. Minor short- and long-term impacts from roadway construction would be offset by the use of best management practices for erosion control. The New Jersey Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.) requires that the local soil conservation district certify a soil erosion and sediment control plan prior to the approval of an application for project development for any land disturbance of 5,000 SF or more. Furthermore, any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District.

No impacts to geology, topography, and soils would occur under the No Action Alternative.

ES.6.10 Vegetation

Minor direct impacts to natural vegetation would occur during the construction of any of the action alternatives. Minor indirect impacts to vegetation may occur adjacent to areas of direct impacts. These include the introduction of non-native, invasive plants along the new roadway and into the adjacent forest, changes in light, temperature, and hydrology, and damage from road treating chemicals. Measures to offset these minor impacts could include minimizing the amount of clearing to the extent practicable and the use of native, non-invasive plants for any ground stabilization or roadside plantings.

No impacts to vegetation would occur under the No Action Alternative.

ES.6.11 Wildlife

As a result of road construction and vegetation clearing, minor impacts to wildlife due to habitat loss and alteration would occur under any of the alternatives. Minor impacts from roadway noise on wildlife, particularly birds, would be expected. Impacts to terrestrial wildlife may occur due to the restriction of movement by the new roadway and security fencing. Increased mortality of terrestrial wildlife could occur because of vehicle collisions. No direct or indirect effects to state- or federally-listed threatened, endangered, and other sensitive species would occur under any of the alternative alignments. Therefore consultation under Section 7 of the Endangered Species Act (16 U.S.C. 1536) is not required. Mitigation to avoid temporary indirect construction impacts for each of the four alternatives would be implemented. These involve best management practices to minimize sedimentation impacts to perennial and intermittent streams and wetlands, and to protect habitat for wetland-dependent species.

No impacts to wildlife would occur under the No Action Alternative.

ES.6.12 Surface Water

Alternative Alignments 1, 2, and 3 would require stream crossings that would involve improvements to existing structures. In particular, these alternatives involve the widening of the bridge over Hockhockson Brook, a trout maintenance stream. It is expected that there may be some minor short-term impacts to water quality due to construction activities near Hockhockson Brook. However, best management practices would be incorporated during construction to minimize potential erosion, runoff, and sedimentation that would affect Hockhockson Brook. Therefore, no impacts to trout downstream of NWS Earle or other off-site water bodies are anticipated. Any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan tailored specifically to the construction site and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District. All waters in the study area have a 150-foot riparian zone associated with them. Activities in riparian zones including the clearing, cutting and/or removal of vegetation are regulated by the NJDEP under the Flood Hazard Area Control Act Rules (New Jersey Administrative Code 7:13).

No impacts to surface water would occur under the No Action Alternative.

ES.6.13 Floodplains

Each of the alternative alignments would traverse U.S. Geological Survey designated, NJDEP published flood-prone areas. Mitigation to offset potential impacts to these areas could occur through compliance with the New Jersey Flood Hazard Area Control Act Rules. Furthermore, alternative alignments would avoid to the extent practicable any development within flood-prone areas.

No impacts to flood-prone areas would occur under the No Action Alternative.

ES.6.14 Wetlands

Each of the alternative alignments would result in permanent impacts to wetlands as well as impacts to wetland transition areas. In order to offset impacts to wetlands, planning and design of each alternative alignment was carried out with a commitment to avoid and minimize impacts to wetlands. The Navy would seek appropriate permits through NJDEP for impacts to wetlands that could not be avoided. Wetland mitigation in the form of restoration, creation, enhancement or contribution would be coordinated with NJDEP.

No impacts to wetlands would occur under the No Action Alternative.

ES.6.15 Environmental Health and Safety

Alternative Alignments 1, 2, and 3 present no impacts to installation restoration sites. However, Alternative Alignment 4 incorporates the entire length of Macassar Road, which bisects the delineated boundaries of Installation Restoration Site 1 (Operable Unit 8). No direct or indirect effects are anticipated to this site from the proposed action. However, this site contains a land use control requirement whereby the Navy must notify the USEPA and the state of New Jersey in writing 60 days prior to the Navy leasing, transferring, or accessing the property. Moreover, the Navy must consult with the USEPA and the state of New Jersey on specific wording for property transfer, sale, or lease documents. The Navy would comply with all land use control stipulations if this alternative is selected to ensure the health and safety of workers during construction and Laurelwood residents. A portion of Alternative Alignment 4 is encumbered by two explosive safety quantity distance arcs. If Alternative Alignment 4 is selected, NWS Earle would alter the type and quantity of ordnance at the D-Group such that existing explosive safety quantity distance arcs no longer encumber the alignment. During the road construction period, the potential for accidents would be increased and the addition of construction-related equipment traffic to roadways and temporary traffic detours could increase the potential for vehicle accidents. Efforts to offset potential short-term effects to safety would include safety fencing and other specific best management practices and policies required by the contractor performing the construction. Under all alternative alignments, there would be no impacts related to Executive Orders for environmental justice and protection of children.

No significant impacts related to environmental health and safety, including Executive Orders for environmental justice and protection of children, would occur under the No Action Alternative.

ES.6.16 Security

Impacts to security from the proposed action are not anticipated. Numerous DoD and Navy regulations impose requirements to ensure that NWS Earle maintains a certain level of security. These standards continue to apply to the Station, even after the provision of access to the Laurelwood housing area. All required security and force protection measures would be incorporated into the proposed action to maintain full compliance with all regulations and standards discussed in Section 3.13.2. The following specific measures would be implemented to

ensure that adequate levels of security are maintained once the Laurelwood housing area is made available to civilians. Perimeter fencing would be implemented along the entire length of the access road as well as surrounding the Laurelwood housing area to segregate this area from the secure portion of the installation. Clear zones would be incorporated into the fence design. Generally the clear zone would consist of an area approximately 30 feet inside the perimeter and 20 feet on the outside. The 20 foot clear zone is achieved by the road shoulder and one traffic lane. Additional security personnel would be implemented as dictated by the specific alternative. Routine security patrols of the access road and the Laurelwood housing area would take place. Additional security measures may be instituted as needed, drawing from the array of measures available as outlined in Section 3.13.2.

No impacts to security would occur under the No Action Alternative.

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR LAURELWOOD HOUSING AREA ACCESS

NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY

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Acronyms and Abbreviations

A.D.	anno Domini
AA&E	arms, ammunition, and explosives
AST	aboveground storage tank
ATR	automated traffic recorder
BRAC	Base Realignment and Closure
B.C.	Before Christ
CAA	Clean Air Act
CAFRA	Coastal Area Facility Review Act
CEIFA	Comprehensive Education Improvement and Financing Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMP	Coastal Management Program
CNFD	Colts Neck Fire Department
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
CNSSTC	California Nevada Super Speed Train Commission
CO	carbon monoxide
CZMA	Coastal Zone Management Act
dB	decibels
dBA	decibels measured with A-weighted metric
dBC	decibels measured with C-weighted metric
DDT	Dichlorodiphenyltrichloroethane
DEIS	Draft Environmental Impact Statement
developer	developer of the Laurelwood housing area
DLUR	Division of Land Use Regulation
DoD	Department of Defense
USDOT	U.S. Department of Transportation
E&E	Ecology and Environment, Inc.
EIS	Environmental Impact Statement
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
FEMA	Federal Emergency Management Agency
FHACA	Flood Hazard Area Control Act
FMERPA	Fort Monmouth Economic Revitalization Planning Authority
FTA	Federal Transit Administration
FWIP	Freshwater Wetlands Individual Permit
FWPA	Freshwater Wetlands Protection Act
GP	General Permit
gpd	gallons per day
HARP	Historical and Archaeological Resource Protection Plan
HCM	Highway Capacity Manual
ICRMP	Integrated Cultural Resources Management Plan
IMPLAN	Impact Analysis for Planning
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
kWh	kilowatt hours
LBA	Louis Berger and Associates, Inc.
LBP	lead-based paint
LEA	Local Educational Agencies
LF	linear feet
LOS	level of service
$\mu g/m^3$	micrograms per cubic meter
mgd	million gallons per day
mph	miles per hour
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NAD	Naval Ammunition Depot
NAVFAC	Naval Facilities Engineering Command
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NJ	New Jersey
N.J.S.A.	New Jersey Statutes Annotated
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJPDES	New Jersey Pollutant Discharge Elimination System
NJDFW	New Jersey Department of Fish and Wildlife
NJDOE	New Jersey Department of Education
NJDOT	New Jersey Department of Transportation
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOI	Notice of Intent
NOMHL	Naval Ordnance Materials Handling Laboratory
NO_X	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWS	Naval Weapons Station
NWSEARLINST	Naval Weapons Station Earle Instruction
O_3	ozone
OPNAVINST	Office of the Chief of Naval Operations Instruction
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
PM	particulate matter
$PM_{2.5}$	PM less than 2.5 micrometers in diameter
PM_{10}	PM less than 10 micrometers in diameter
POL	petroleum, oil, and lubricant
ppm	parts per million
ppb	parts per billion
PPV	public private venture
pre-K	pre-kindergarten
RCRA	Resource Conservation & Recovery Act
ROI	region of influence

SF	square feet
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	oxides of sulfur
TAW-LD	Transition Area Waiver for Linear Developments
TSCA	Toxic Substances Control Act
TSP	Total Suspended Particulate Matter
UFC	Unified Facilities Criteria
U.S.	United States
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USS	United States Ship
UST	underground storage tank

1 PURPOSE AND NEED

The United States Department of the Navy (U.S. Navy) has prepared this document in accordance with the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Chief of Naval Operations (CNO) Instruction 5090.1C *Environmental and Natural Resource Program Manual*.

The Navy is the lead agency for the proposed action. No other agencies have been identified to serve as cooperating agencies in accordance with 40 CFR 1501.6.

1.1 PROPOSED ACTION

The proposed action being evaluated in this Environmental Impact Statement (EIS) is the provision of unimpeded access between the Laurelwood housing area at mainside Naval Weapons Station (NWS) Earle and an adjacent state primary or secondary road (Figures 1-1 and 1-2) pursuant to a lease agreement between the U.S. Navy (lessor) and the developer of the Laurelwood housing area (lessee) (hereinafter referred to as 'developer') (U.S. Navy 1988a). In accordance with Paragraph 15 of Supplemental Lease Agreement 43:

> "The Government and Lessee agree and acknowledge that the Government may satisfy such obligation by either (a) providing unimpeded access or (b) providing an easement for alternate access adequate to allow Lessee to construct a road from a Highway to the Leased Property that will provide unimpeded access (the "New Access Road"). As used herein, "unimpeded access" shall mean that the Government will impose no access requirements to residents or the public to obtain access to the Leased Property beyond those generally imposed in similar private residential developments."

All of the alternative alignment routes provide dedicated access to Laurelwood via new entrances on State Route 34 (Figure 1-2). The selected alternative alignment route and the Laurelwood housing area would be securely separated from the functioning installation. The Navy's EIS will review and assess four different alternative alignment routes as well as the No Action Alternative.

1.2 PURPOSE AND NEED

The purpose for the action is to provide unimpeded access between the Laurelwood housing area at mainside NWS Earle and an adjacent state primary or secondary road subject to federal, state, and local laws and regulations. The need for the action is to satisfy the contractual obligation of a lease agreement for the Laurelwood housing area between the Navy and a private developer. Background on this lease agreement is provided in Section 1.3.2.

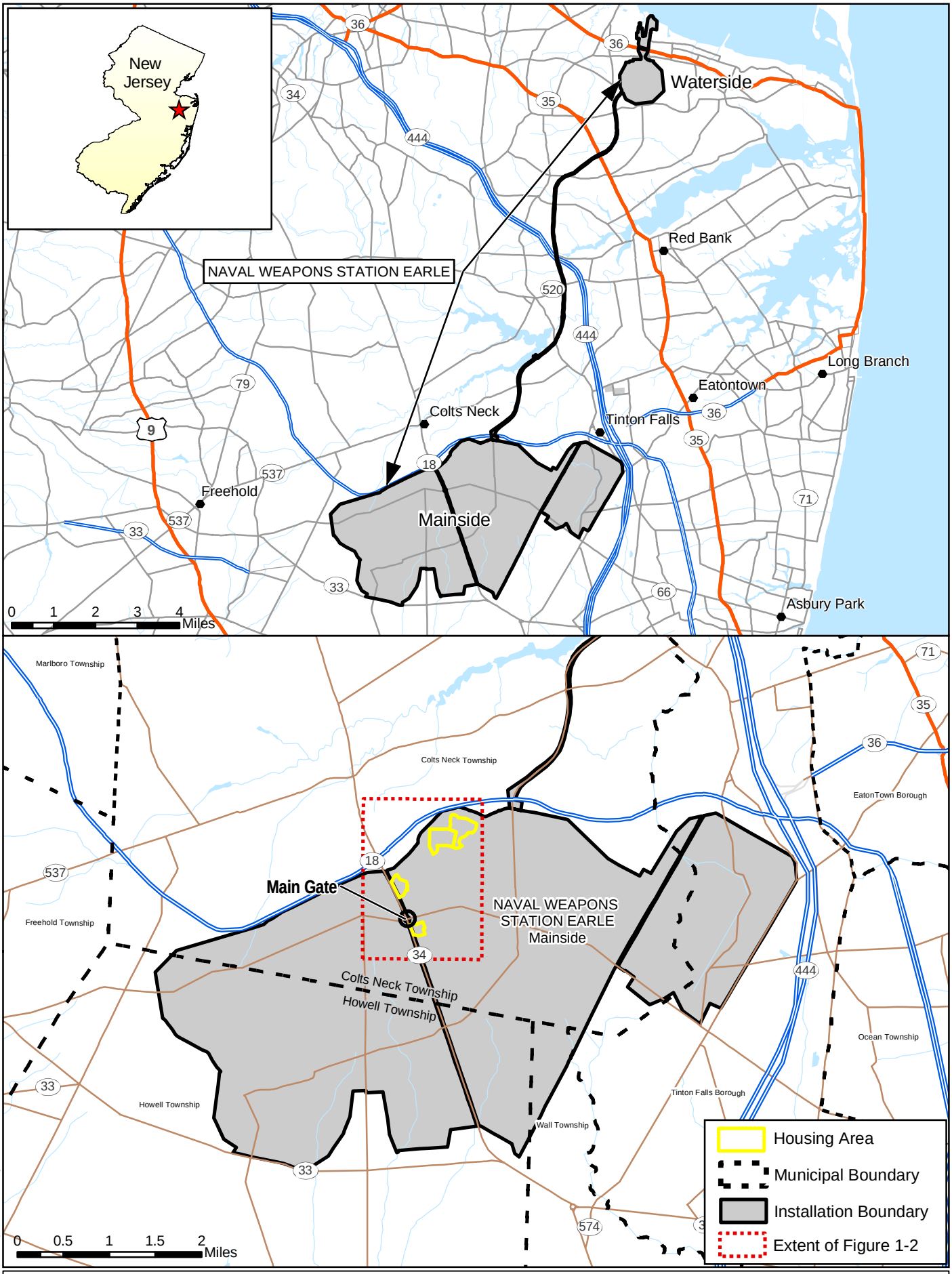


Figure 1-1
Vicinity Map -- NWS Earle

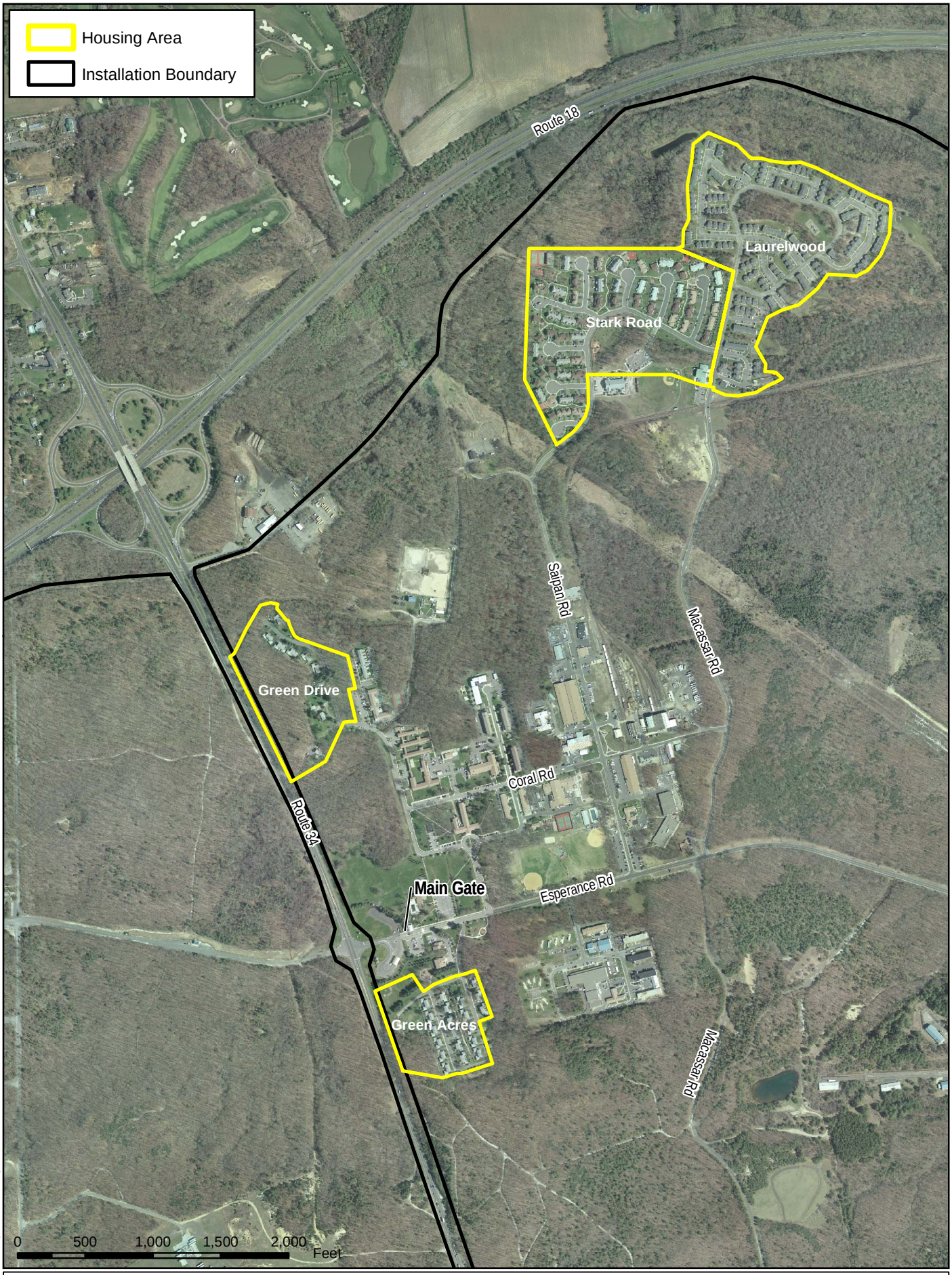


Figure 1-2
Housing Areas at NWS Earle Mainside

1.3 BACKGROUND

Naval Weapons Station Earle is an 11,035-acre facility located entirely within Monmouth County, New Jersey (Figure 1-1). The installation is comprised of two separate land holdings connected by a 14-mile highway and rail line. Mainside is adjacent to the intersection of Route 34 and Route 18 and is located within portions of Colts Neck Township, Tinton Falls Borough, Howell Township, and Wall Township (Figure 1-1 and Figure 1-2). The waterfront site is located on Sandy Hook Bay along the Atlantic Ocean in Leonardo, New Jersey. All housing associated with NWS Earle is located at mainside.

The Naval Munitions Command, CONUS East Division Detachment Earle performs the station's primary mission—providing ammunition to the Fleet.

The population working at NWS Earle (mainside and waterside locations) is comprised of 1,473 military, civilian, and contractor personnel. Table 1-1 provides a breakdown of the population associated with NWS Earle as of May 2007.

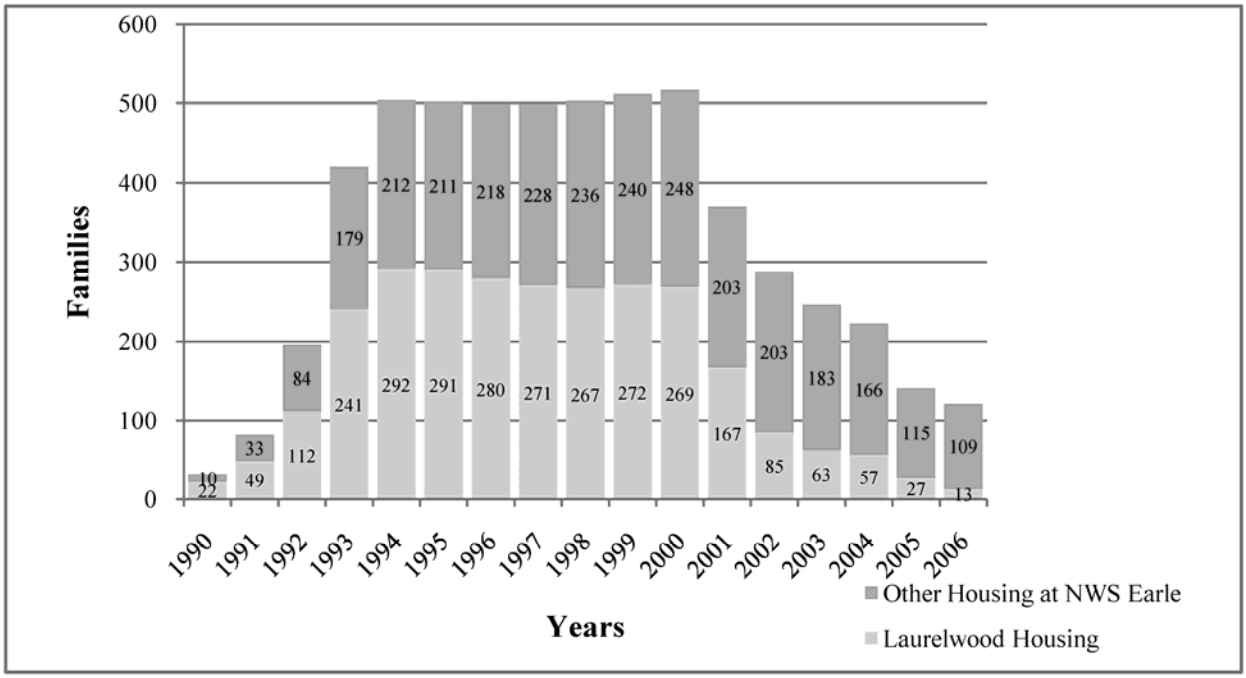
Table 1-1 Population Associated With NWS Earle, 2007

Category	Population
Installation Workforce	
Base Military	251
Civilians	89
Contractors	258
Tenant/Ships Workforce	
Tenant Military	90
Tenant Civilians	269
Ships Military	62
Ships Civilians	454
Total Workforce	
Military	403
Civilian	812
Contractors	258
Total	**1,473**

Source: U.S. Navy 2007a

The military family population residing at NWS Earle has fluctuated over the past 17 years. The highest level of military families at the installation occurred in the years 1994 to 2000, corresponding with the homeporting of Fast Combat Support ships at the installation (see Table 1-2). The installation experienced the largest population in 2000, with more than 500 military families resident at that time. Beginning in 2001, the ships were converted to civilian manned ships of the Military Sealift Command and the number of military families residing on base was reduced.

Table 1-2 Military Families Residing at NWS Earle: 1990-2006



Source: McCaffrey 2007b. Notes: Data from NWS Earle utilization reports dated September 30, 2007. The number of housing units at NWS Earle (and the number of families residing at NWS Earle) has fluctuated over time. For example, in the year 2000 there were 258 housing units at NWS Earle, not counting Laurelwood housing. However, in 2007 there were 229 housing units (not counting Laurelwood housing) as shown in Table 1-3 below.

1.3.1 Existing Housing Conditions at NWS Earle

All housing for military personnel associated with NWS Earle is located at mainside. Naval Weapons Station Earle contains four distinct housing developments within the mainside fence line: Green Drive, Green Acres, Stark Road, and Laurelwood. These housing areas consist of single-family homes and multiplex-style townhouses. Figure 1-2 identifies the location of these housing areas. Navy-occupied housing includes the Green Drive, Green Acres, and Stark Road housing areas. Table 1-3 provides details for each of the three Navy-occupied housing areas at NWS Earle as of May 2007, including bedroom type, number of units occupied, and population.

Table 1-3 Existing Conditions for Navy-Occupied Housing Areas, 2007

Housing Area	Total Number of Units (Number Occupied)					Population				
	2-bedroom	3-bedroom	4-bedroom	6-bedroom	Total	Military	Spouses	School-Age Children	Non School-Age Children	Total
Stark Road	112 (8)	28 (26)	42 (39)	--	182 (73)	73	73	92	52	290
Green Drive	--	6 (4)	1 (1)	--	7 (5)	5	5	4	5	19
Green Acres	6 (3)	32 (19)	--	2 (2)	40 (24)	24	24	20	13	81
Totals	118 (11)	66 (49)	43 (40)	2 (2)	229 (102)	102	102	116	70	390

Source: U.S. Navy 2007a

The 300-unit Laurelwood housing area, although currently used to house military personnel and their dependents, is not owned and operated by the Navy. Laurelwood was constructed in 1988 through a contract between the Navy and a developer. The Navy guarantees rent payments to the developer for all 300 Laurelwood units through 2010 through a long-term lease agreement. The Navy owns the underlying land at Laurelwood; however, the developer owns and operates these

units during the lease agreement time period. Further details about this lease agreement are described in Section 1.3.2. Table 1-4 provides details for the Laurelwood housing area at NWS Earle as of May 2007, including bedroom type, number of units occupied, and population.

Table 1-4 Existing Conditions for Laurelwood Housing Area, 2007

Housing Area	Total Number of Units (Number Occupied)				Population				
	2-bedroom	3-bedroom	4-bedroom	Total	Military	Spouses	School-Age Children	Non School-Age Children	Total
Laurelwood	204 (2)	60 (5)	36 (3)	300 (10)	10	10	15	5	40

Source: U.S. Navy 2007a

For the purposes of analysis in this EIS, the housing conditions described in Table 1-4 will be considered baseline conditions for the Laurelwood housing area.

1.3.2 Laurelwood Housing Area Lease Agreement

In 1988 the Navy contracted with a developer to construct, own, and operate 300 military family housing units at NWS Earle, now known as the Laurelwood housing area. At that time, the 300 units were necessary to satisfy a need for additional military housing for personnel associated with Fast Combat Support ships homeported at NWS Earle. A 52-year lease agreement for the underlying land was executed between the Navy and the developer which included an in-lease and an out-lease period. During the in-lease period, which runs from 1988 until 2010, the Navy guarantees rent payments to the developer for the occupancy of all 300 Laurelwood units. Only military personnel and their dependents are allowed to occupy these housing units during the in-lease period. The out-lease period runs from 2010 until 2040. During the out-lease period the Navy no longer rents housing units at the Laurelwood housing area and the developer may rent units to the general public.

Specific citations of the lease agreement (U.S. Navy 1988a) follow below:

> Part I, paragraph D., page 2 – Use: "Upon the termination of the Inlease, the Lessee shall have the right to lease the housing constructed for the Government to members of the general public of Lessee's own choosing and to set rental rates and other terms of occupancy consistent with applicable laws and regulations."
>
> Exhibit A of the in-lease stipulates that "Access to the site for the first twenty (20)-year term of the Inlease, shall be owned, operated and maintained by the Government. Thereafter, reasonable access shall be granted. Reasonable access is defined as being on a paved road, constructed, operated and maintained by Lessee at its own cost, on such access, pursuant to state, county and township specification at time of construction."
>
> Paragraph 15 of Supplemental Lease Agreement 43: "The Government and Lessee agree and acknowledge that the Government may satisfy such obligation by either (a) providing unimpeded access or (b) providing an easement for alternate access adequate to allow Lessee to construct a road from a Highway to the Leased Property that will provide unimpeded access (the "New Access Road"). As used herein, "unimpeded access" shall mean that the Government will impose no access requirements to residents or the public to obtain access to the Leased Property beyond those generally imposed in similar private residential developments."

Paragraph 15 of Supplemental Lease Agreement 43 defines the responsibilities assigned to the Navy and the developer regarding the provision of reasonable access:

> "The Government shall be responsible for the costs associated with obtaining all necessary permits and approvals, including but not limited to any initial and ongoing mitigation efforts, if any, and Lessee shall be responsible only for the direct construction costs associated with building and maintaining the New Access Road as soon as all necessary permits and approvals are obtained . . ."

In 2040, the lease agreement expires and the developer is obligated to demolish the 300 housing units.

> Outlease, Part I, G: "Lessee shall within sixty (60) days after expiration or prior termination of this lease . . . remove all buildings, structures, fixtures and other improvements constructed or placed on the Leased Property . . . After Lessee removes all buildings, structures, fixtures and other improvements, Lessee shall restore the property at the expiration of this lease."

1.3.3 Schools

All housing areas at NWS Earle are located within the boundaries of the Colts Neck Township. However, under current New Jersey law, children residing at mainside NWS Earle are educated in Tinton Falls schools. This arrangement came about in 1987, predicated on a Civil Action Stipulation of Compromise and Settlement between the Colts Neck Township and the Department of the Navy. The settlement stipulated dismissal of the lawsuit upon the occurrence of a number of events, including the following: 1) approval of legislation by the New Jersey Legislature and the Governor of New Jersey authorizing the Board of Education of a receiving school district to indicate, by resolution, a desire to receive dependents from another school district; 2) adoption of a Resolution by the Tinton Falls Board of Education requesting to educate dependents at NWS Earle; and 3) written designation of Tinton Falls School District by the Monmouth County Superintendent of Schools as the designated district for dependents at NWS Earle.

The State of New Jersey enacted the statute. In April 1988 the Board of Education of the Tinton Falls School District passed a resolution pursuant to that statute requesting a designation (Tinton Falls Board of Education 1988a) (Appendix C). Based on that resolution, the Monmouth County Superintendent of Schools designated the Tinton Falls School District as the district to receive the students residing on federal property [NWS Earle] (Monmouth County Superintendent of Schools 1988).

In June 1988 as part of the settlement, the U.S. Navy entered into a Memorandum of Agreement with the Board of Education of the Tinton Falls School District for a series of financial support payments (Tinton Falls Board of Education 1988b). These payments were intended to enable the use of temporary classrooms until Tinton Falls could expand to accommodate all students that would reside in the Laurelwood housing.

1.3.4 Future Housing Conditions at NWS Earle

The Laurelwood housing area population would be directly affected by the proposed action. Moreover, implementation of the proposed action is a requirement of the lease agreement as described in Section 1.3.2. Therefore, future conditions at Laurelwood are described in detail in Chapter 2 as an introduction to the proposed action. It is relevant to discuss the anticipated effects that implementation of the proposed action would have on the population of Laurelwood within Chapter 2 because population estimates affect many resource areas analyzed later in this EIS.

The expected future condition at Navy-occupied housing is described in Section 1.3.4.1 below because Navy-occupied housing is not part of the proposed action.

1.3.4.1 Navy-Occupied Housing Areas

Naval Weapons Station Earle is involved with a public-private venture (PPV) initiative for the long-term management of all Navy-occupied housing (i.e., Stark Road, Green Drive, and Green Acres). Implementation of the PPV initiative at NWS Earle has already been evaluated under separate NEPA documentation (U.S. Navy 2004a). As described in Section 1.3.2, Laurelwood housing units are owned by a private developer and are not part of PPV. Under the PPV initiative, the Navy has entered into a 50-year agreement with a private entity to build/replace, maintain, and manage the appropriate number of Navy-occupied housing units necessary to support the current and projected military personnel (and dependents) assigned to NWS Earle. A Housing Requirement and Market Analysis (U.S. Navy 2002a) prepared for NWS Earle concluded that 89 two-, three-, and four-bedroom housing units would satisfy the current and future needs of military personnel and their dependents. The PPV entity completed the process of demolishing and renovating existing Navy-occupied housing units at the Stark Road and Green Drive neighborhoods to reach the requisite end state of 89 units in 2008. Under PPV, the Navy would transfer the Green Acres housing area and underlying land to the PPV entity. This housing area would no longer be considered military family housing. The NWS Earle perimeter fence would be moved to exclude the Green Acres housing area from the installation. The PPV entity would construct a new road for access. Table 1-5 provides housing unit details for the two Navy-occupied housing areas at NWS Earle following complete implementation of PPV activities.

Table 1-5 Future Conditions for Navy-Occupied Housing Areas

Housing Area	Total Number of Units*				Estimated Population				
	2-bedroom	3-bedroom	4-bedroom	Total	Military	Spouses	School-Age Children[1]	Non School-Age Children	Total
Stark Road	16	24	42	82	82	82	118	72	354
Green Drive	0	6	1	7	7	7	9	6	29
Totals	**16**	**30**	**43**	**89**	**89**	**89**	**127**	**78**	**383**

*Estimates assume 100% occupancy.

[1]Percentage of children considered school-age is 62 percent and is based on existing distribution of children in Navy-occupied housing.

Military base populations fluctuate throughout a given year due to the military personnel rotation cycle and therefore populations associated with Navy-occupied military family housing areas are subject to change from month to month. For point of reference, the NWS Earle Housing Office reports that there were 390 military personnel and dependents residing in Navy-occupied housing areas in May 2007 (see Table 1-3).

The Navy estimated the future population associated with Navy-occupied family housing involved with the PPV initiative. This estimate is based on the number of bedrooms per unit and assumes that the bedrooms in a housing unit are occupied by one child per bedroom with one bedroom reserved for one military person and his/her spouse. For example, a 3-bedroom unit would consist of one military person, their spouse, and two children for a total of four people in the unit. At NWS Earle, it is assumed that 62 percent of the children in each occupied unit will be school-age. This percentage is based on the actual number of school-age children living in military family housing at NWS Earle in May 2007 as shown in Table 1-3. For the purposes of developing population estimates in this EIS, the occupancy rate for Navy-occupied military family housing at NWS Earle is assumed to be 100 percent. Given these conditions, Table 1-5 provides the estimated population associated with Navy-occupied military family housing units following completion of PPV activities.

The estimated population is calculated by adding total military, spouses, school-age children, and non school-age children for a total of 383 military and dependents associated with Navy-occupied housing.

The PPV activities at Navy-occupied housing areas were completed in 2008. Given the timeline for completion of this EIS, the housing conditions described in Table 1-5 will be considered baseline conditions for Navy-occupied housing areas.

1.4 PUBLIC INVOLVEMENT

NEPA regulations require an early and open process for determining the scope of issues that should be addressed prior to implementation of a proposed action. The Navy initiated the public scoping process on November 9, 2007, by publishing a Notice of Intent (NOI) to prepare an EIS in the *Federal Register*, and sending copies of the NOI to federal, state, and local agencies, and other parties known or expected to be concerned about the proposed action.

A public scoping meeting was held on November 27, 2007 at Brookdale Community College located at 765 Newman Springs Road, Lincroft, New Jersey in Monmouth County between 4:00 PM and 8:00 PM. Comments from the public scoping meeting as well as written comments received in response to the published NOI have been considered during development of the DEIS.

The Notice of Availability of the DEIS was published in the *Federal Register* on November 28, 2008, marking the beginning of the public comment period. A public hearing and open house session was held on December 16, 2008 at the Performing Arts Center of the Monmouth

Regional High School in Tinton Falls, New Jersey. The open house session was held from 4:00 PM to 5:30 PM where attendees could discuss the EIS with Navy representatives. The public hearing took place between 6:00 PM and 10:00 PM. The purpose of the meeting was to receive oral and written comments on the DEIS. Comments received at the public hearing and throughout the formal comment period have been addressed in Volume II of the Final EIS. The formal comment period was extended to January 23, 2009 at the request of several members of the public.

In addition to hosting an open house and public hearing for the DEIS, the Commanding Officer and staff of NWS Earle provided briefings of the proposed action to New Jersey Congressman Christopher Smith on December 16, 2009 and the Director of the New Jersey Department of Homeland Security on February 3, 2009.

The issues raised during the public scoping period and DEIS comment period are categorized by issue and summarized below.

Alternatives
(Section 2.0)

- Evaluate a buy out of the developer.
- Restrict Laurelwood housing area to senior housing; homeless; disabled; or veterans.
- Action alternatives should include payments to build necessary community infrastructure (e.g., schools, etc.).
- Stagger occupation of Laurelwood housing area.

Security
(Sections 3.13 and 4.13)

- Concern about security/safety of local residents as well as military families living nearby.
- Concern over specific security measures that would be implemented.

Natural Resources
(Sections 3.10, 3.11, 4.10, and 4.11)

- Impacts to wetlands.
- Impacts to rare, threatened, and endangered species on NWS Earle.
- Impacts to aquifer.

Socioeconomics
(Sections 3.2 and 4.2)

- Additional tax burden on citizens.
- Relationship between NWS Earle and communities would be adversely impacted.
- Affordable housing needs in the local community.
- Fiscal and social impacts on military personnel.

Traffic
(Sections 3.5 and 4.5)

- Traffic impacts to local roads, including Route 18, Route 34, Colts Neck Road.

Cultural Resources
(Sections 3.8 and 4.8)

- Potential impacts to archaeological resources.

Community Facilities and Services
(Sections 3.3 and 4.3)

- Concern about overcrowding school infrastructure as well as class sizes and teacher resources.
- Concern about loss of funding for school programs to pay for education of additional students.
- Concern that quality of education would decrease.
- Diversity of students in school system would be beneficial to community.
- Concerns over amount of Federal Impact Aid payments.
- Potential burden on police and fire/rescue resources of the community.

Utilities
(Sections 3.4 and 4.4)

- Impacts to potable water supply.
- Concerns over solid waste disposal.
- Concerns over wastewater treatment.

Land Use
(Sections 3.1 and 4.1)

- Laurelwood housing area does not fit with the local community culture and zoning.
- Impacts to rural character of Colts Neck.

Environmental Health and Safety
(Sections 3.12 and 4.12)

- Potential impacts to potable water from contaminated sites at NWS Earle.
- Presence of munitions stored at NWS Earle and safety of residents.
- Presence of installation restoration sites at NWS Earle in the vicinity of housing area.

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to describe the potential alternatives to implement the proposed action, which is the provision of unimpeded access between the Laurelwood housing area at mainside NWS Earle and an adjacent state primary or secondary road.

Section 2.2 of this chapter describes the mix of housing type and estimated population during the out-lease period (2010 to 2040) for Laurelwood should the proposed action be implemented. Section 2.3 presents a discussion of the planning process the Navy employed to identify the full spectrum of alignments connecting Laurelwood with adjacent roads. Section 2.4 describes the screening criteria the Navy applied to each of these identified alignments. The purpose for applying screening criteria to this proposed action is to narrow the list of alternatives generally discussed in Section 2.3 to those that are feasible to implement and that meet the purpose and need for the action. Alternatives that fail to meet one or more of the criterion in Section 2.4 and fail to meet the purpose and need for the action are not carried forward for analysis in this EIS. These alternatives are summarized in Section 2.4.1. Section 2.4.2 fully describes each of the alternatives carried forward for analysis in this EIS.

2.2 ASSUMED FUTURE HOUSING CONDITIONS FOR LAURELWOOD HOUSING AREA UNDER PROPOSED ACTION

The lease agreement for Laurelwood, described in Section 1.3.2, contains an out-lease period from 2010 to 2040. During the out-lease period, the Navy no longer rents housing units at Laurelwood and the developer may rent units to the general public. However, the lease requires that the Navy provide unimpeded access between the Laurelwood housing area and an adjacent state primary or secondary road or grant an easement for the developer to construct a road (or portion of a road) subject to federal, state and local laws and regulations. This requirement to provide unimpeded access is the proposed action in this EIS. Regardless of which alternative alignment is selected to implement the proposed action, it is expected that the occupancy rate of Laurelwood would change if the general public is allowed to rent unoccupied units.

No changes to the existing quantity and type (i.e., bedroom mix) of housing units at Laurelwood would occur under the proposed action. Laurelwood would continue to be a mix of 2-, 3-, and 4-bedroom attached single family housing units as described in Table 2-1.

The Center for Urban Policy Research at Rutgers University published a collection of *residential multipliers* derived from the 2000 U.S. Census 5-percent Public Use Microdata Sample (Center for Urban Policy Research 2006). These multipliers allow a user to estimate the likely number of people (total population) and school-age children generated by specific types of residential development in New Jersey. This particular study is an update to a previous Rutgers residential multiplier study based on 1980 Census data that has been widely applied throughout the United States to assess development impacts. The data fields and organization of the residential

demographic multipliers include: household size (total persons per housing unit); age distribution of the household members (organized into age categories); total school-age children or number of persons in the household of school-age, defined as those 5 to 17 years old; total public school children; and public school children divided into elementary school, middle school, and high school. These demographic fields are differentiated by housing type, housing size, housing price, housing tenure, and housing location. Residential demographic multipliers are available for the State of New Jersey as well as three different regions of New Jersey: North, Central, and South. The statewide multipliers have the largest sample universe and therefore have relatively lower standard error, tighter confidence interval, and lower error margin as percentage when compared to the regional multipliers. The regional-specific multipliers, however, provide the benefit of place sensitivity[1].

This EIS uses the Central New Jersey residential demographic multipliers, which include the counties of Hunterdon, Mercer, Middlesex, Monmouth, Ocean, and Somerset, instead of the statewide multipliers. It is assumed that the regional multipliers would present a more accurate representation of the demographics in the area of the proposed action by not including data from the more urban northern counties of the state. A range of multipliers, representing the 90 percent confidence interval, were used in this analysis in estimating total population and total school-age children. A confidence interval quantifies the uncertainty in measurement by providing a range of estimates from low to high that has a specified probability (in this case 90 percent) of containing the true population estimate. For the purposes of this EIS, analyses of potential impacts to resource areas will consider the high estimate for total population and total school-age children.

It is assumed that during the out-lease period Laurelwood would be occupied by non-military families and thus mimic a typical single-family attached housing development. The population estimates also assume 100 percent occupancy of the Laurelwood housing area.

Given these conditions, the maximum total population occupying the Laurelwood housing area at any given time during the 2010 to 2040 out-lease period is estimated at 853 (Table 2-1). Of this total, a maximum of 145 are estimated to be school-age children.

[1] The U.S. Navy sent a written request to potentially affected school districts and municipalities on November 7, 2007 requesting an explanation of the methodology they recommended/employed to estimate the number of school-age children associated with new developments. Nothing has been forthcoming. Accordingly, the Navy has relied on data presented in the FEIS.

Table 2-1 Future Conditions for Laurelwood Housing Area During Out-lease Period

Housing Type	Number of Units	Total Population		Total School-Age Children	
		Low Estimate	***High Estimate***	***Low Estimate***	***High Estimate***
Single-Family Attached (2 Bedroom Unit)[1]	204	436	501	52	67
Single-Family Attached (3 Bedroom Unit)[1]	60	128	147	15	20
Single-Family Attached (4 Bedroom Unit)[2]	36	119	205	29	58
Totals	**300**	**683**	**853**	**96**	**145**

Sources: U.S. Census Bureau 2003a; Center for Urban Policy Research 2006

[1]The following multipliers were used for single-family attached 2-3 bedroom unit in central New Jersey (all housing unit values): Total Population (Low = 2.136, High = 2.456); Total School-Age Children (Low = 0.256, High = 0.328). "Low" and "High" values represent the 90% confidence interval for this housing type.

[2]The following multipliers were used for single-family attached 4-5 bedroom unit in central New Jersey (all housing unit values): Total Population (Low = 3.306, High = 5.689); Total School-Age Children (Low = 0.818, High = 1.602). "Low" and "High" values represent the 90% confidence interval for this housing type.

Notes:

--Multipliers derived from Census 2000, 5 Percent Public Use Microdata Sample and are based on data set for Central New Jersey, which includes the counties of Hunterdon, Mercer, Middlesex, Monmouth, Ocean, and Somerset.

--Estimates assume 100% occupancy.

2.3 ALTERNATIVES IDENTIFICATION

The Navy initiated a planning process in 2002 to identify any conceivable alignment that might satisfy the conditions of the lease agreement. At the end of a 3-year planning process the Navy had identified 18 different alignments to consider. The planning process involved numerous working group meetings, command briefings, and the development of four reports that describe characteristics of each of the 18 alignments.

Of the 18 alignments, 8 were designed to access NWS Earle using the main gate. Three alignments involve use of property that is owned by the Navy and leased to the Colts Neck Township for the Township's school bus parking and storage facility. One alignment requires construction of a new intersection on Route 18 that connects directly with Laurelwood. Two alignments involve the use of Normandy Road near Route 18. Three alignments require the construction of new intersections to Route 34 near the Green Drive housing area. One alignment requires the construction of a new intersection on Route 34 approximately 1,750 feet south of the main gate. Table 2-2 briefly describes these alignments.

Table 2-2 Summary of Potential Alignments

Alignment Category	Number of Alignments	Description
Main Gate Alignments	8	Alignments access the installation and the Laurelwood housing area through the main gate. Alignments use existing roads, new roads, or a combination of new and existing roads to link with Laurelwood.
School Bus Road Alignments	3	Alignments involve use of property that is owned by the Navy and leased to the Colts Neck Township for the Township's school bus parking and storage facility. The school bus parking and storage facility access road intersects with the northbound Route 34 ramp to Route 18 south. Alignments use a combination of new roads and upgraded existing roads to link with Laurelwood.
Route 18 Alignment	1	Alignment requires construction of a new intersection on Route 18 that connects directly with Laurelwood housing area. Upgrade to existing road is required to link with Laurelwood.
Normandy Road Alignments	2	Two alignments involve the use of Normandy Road near Route 18. A new road would be constructed from Normandy Road to either the east or north side of the Laurelwood housing area.
Route 34 North Alignments	3	Alignments require construction of a new intersection to Route 34 near the Green Drive housing area. Two different locations for the entrance are proposed, depending on the alignment. Alignments use a combination of new roads, existing roads, and upgraded existing roads to link with Laurelwood.
Route 34 South Alignment	1	Alignment requires construction of a new intersection to Route 34 approximately 1,750 feet south of the main gate. Alignment uses a combination of new roads, existing roads, and upgraded existing roads to link with Laurelwood.

2.4 ALTERNATIVES SCREENING CRITERIA AND SELECTION PROCESS

Consistent with NEPA, this EIS will evaluate a reasonable range of practicable alternatives that meet the purpose and need of the proposed action. The proposed action being evaluated in this EIS is the provision of unimpeded access between the Laurelwood housing area at mainside NWS Earle and an adjacent state primary or secondary road. The need for this action is to satisfy the contractual obligation of a lease agreement between the Navy and a private developer for the Laurelwood housing area.

In addition to meeting the purpose and need, there are other requirements that a particular alignment must meet in order to be a practicable alternative to the proposed action. These requirements are described in Table 2-3 below in the form of screening criteria. Each of the 18 alignments briefly summarized in Section 2.3 and Table 2-2 has been evaluated against each of these criteria. If an alignment fails to satisfy any one criterion, then that alignment is not considered a practicable alternative and is eliminated from further consideration in this EIS.

Table 2-3 Alternatives Screening Criteria

Criterion 1	**Meets the contractual obligations of the lease agreement between the Navy and the developer.** *Each alignment must meet the contractual obligations of the lease agreement between the Navy and the developer (as well as subsequent amendments and court orders) concerning the Laurelwood housing area. The Navy is required to provide reasonable and unimpeded access to a state, primary or secondary road subject to federal, state, and local laws and regulations (U.S. Navy 1988a, b).*
Criterion 2	**Tenable and safe access to adjacent public roads.** *Access to an adjacent state, primary or secondary road must be obtainable subject to federal, state, and local laws and regulations. In addition, the access road cannot be configured in a way that presents an unnecessary safety issue for the users.*
Criterion 3	**Does not compromise NWS Earle security.** *Naval Weapons Station Earle is a U.S. Naval weapons station, and as such, is required to maintain a high level of security at all times. Alignments cannot adversely affect or compromise the required security procedures and posture of the installation.*
Criterion 4	**Does not affect the ability of NWS Earle to maintain acceptable operational/mission capability.** *The primary mission of NWS Earle is to provide Fleet operational services and infrastructure management to support Combat Logistics Force homeporting, ordnance functions, and tenant activities in execution of the National Military Strategy. Alignments cannot adversely impact the ability of NWS Earle personnel to effectively conduct daily operations and execute the installation's mission.*

2.4.1 Alternatives Eliminated from Further Consideration

2.4.1.1 Main Gate Alignments

Eight potential alignments provide access to Route 34 at the main gate. From this point, the alignments use existing roads, new roads, or a combination of new and existing roads to link with the Laurelwood housing area. All of the potential main gate alignments fail to meet the requirements of Criterion 1 due to a stipulation contained in a U.S. District Court Settlement Agreement (U.S. Navy 1988b). This settlement agreement states that school buses used to transport students from NWS Earle to the Tinton Falls School District cannot use the main gate except in an emergency. School buses currently use the Normandy Road gate for access to NWS Earle. All school-age children residing in Laurelwood attend schools in the Tinton Falls School District and each of the main gate alignments enter and exit through the main gate. In addition,

the Navy has determined that installation security (Criterion 3) and operational capability (Criterion 4) would be adversely impacted if Laurelwood residents were routed through the main gate area.

2.4.1.2 School Bus Storage Facility Road Alignments

Three potential alignments involve the use of a road that is owned by the Navy and leased to the Colts Neck Township. This road is used by the Township to access their school bus parking and storage facility. The bus parking and storage facility access road intersects with the northbound Route 34 ramp to Route 18 south. Alignments use a combination of new roads and upgraded existing roads to link with the Laurelwood housing area. All of the potential school bus road alignments fail to meet the requirements of Criterion 2.

During a meeting with the New Jersey Department of Transportation (NJDOT) on 23 August, 2007, the Navy determined that use of this location for access to Route 34 would not be approved by the state due to its proximity to the Route 18 interchange, as the existing driveway intersects with the acceleration and deceleration lanes for the Route 18 interchange. The following citations from the NJDOT Access Code (NJDOT 1997) provide further details in support of this conclusion:

- NJDOT Access Code, Section 16:47-3.5, Unsignalized Access Points, subheading 6 reads "No access point shall be located along an acceleration, deceleration or left-turn lane where the lane is at its full width." Observations indicate that the northbound Route 34 ramp to Route 18 south is at its full width at this location.

- NJDOT Access Code Section 16:47-3.4, Location of traffic signals and other provisions, subheading (b) reads: "The location of signalized access points also shall comply with the standards for unsignalized access points set forth in 16:47-3.5", thereby incorporating the section noted above.

Moreover, locating the alignment entrance at this point would present an unnecessary safety issue for residents of Laurelwood and vehicles accessing the on-ramp, particularly during peak hours. The NJDOT confirmed that an entrance at this location would not be approved. A signed memorandum stating this conclusion is forthcoming from NJDOT's Bureau of Major Access Permits.

2.4.1.3 Route 18 Alignment

One potential alignment provides access to the Laurelwood housing area via a new grade-separated interchange with Route 18 directly to the north side of the housing area. This alignment fails to meet the requirements of Criterion 2. Route 18 is classified as an Access Level 1 "rural" expressway. Access is prohibited to Level 1 roads unless using a grade-separated interchange (NJDOT 1997). The New Jersey Access Code requires that spacing between interchanges be two miles. Specifically, the Access Code states in Section 16:47-3.3, *Location of interchanges*, subheading (d)-2: "An interchange on a State highway segment classified as rural

. . . shall be at least two miles (3,200 meters) from the closest existing interchange." At this point, the distance between the proposed alignment entrance to Route 18 and the Route 34 interchange is 1,676 meters, or just over one mile. In light of this spacing requirement and discussions with representatives of NJDOT on 23 August, 2007, a grade-separated interchange at this location would not be approved (U.S. Navy 2008f). A signed memorandum stating this conclusion is forthcoming from NJDOT's Bureau of Major Access Permits.

2.4.1.4 Normandy Road Alignments

Two alignments involve the use of Normandy Road near Route 18 (see Figure 3-2). A new road would be constructed from Normandy Road to either the east or north side of the Laurelwood housing area. Both of these potential alignments fail to meet Criteria 1 and 4. Criterion 1 is not met for the alignment accessing the eastern side of the Laurelwood housing area because the Navy could not provide an unimpeded connection without removing one or more housing units to accommodate the right-of-way. Both potential alignments fail to meet the requirements of Criterion 4. Normandy Road is a key transportation corridor for military transport trucks and other vehicles in fulfilling the Station mission. Use of Normandy Road for Laurelwood access would require the implementation of enhanced security measures and would adversely affect the logistics of mission critical transport.

2.4.1.5 Buy Out Option or Lease Termination

The Navy will not evaluate entering into negotiations with the Developer to buy out the out-lease portion of the lease agreement in this EIS, nor will it evaluate termination pursuant to the National Emergency Termination clause in Part I, Paragraph E, Page 2 of the Lease. This EIS is designed to evaluate the environmental impacts associated with the various alternatives for providing the necessary access to the Developer. Accordingly, the EIS considers only alternatives that meet the purpose and need expressed above, which are those that enable the Navy to meet its contractual obligations. Both a buyout and a termination pursuant to the National Emergency Termination clause are too speculative to be examined in any meaningful fashion. For a buyout, the Developer and Navy would have to agree on a price. In a National Emergency Termination, the parties would have to determine the compensation for termination as dictated by the out-lease. Under either scenario, Congress would have to appropriate the funds, and the entire action would have to be completed in time to avoid a breach of the contractual agreement as well as allow the Navy to consider providing the access that the contract requires. Finally, should the Navy attempt to pick such a speculative action to the exclusion of preparing to adhere to its contract, the Navy would run an unacceptable risk of being unable to meet those obligations. Accordingly, because they fail to satisfy the contractual obligations under the lease agreement, neither buying out the Developer nor terminating pursuant to the National Emergency clause would meet the purpose and need for the proposed action, and as such these are not reasonable alternatives for the stated purpose and need.

2.4.2 Alternatives Carried Forward for Analysis

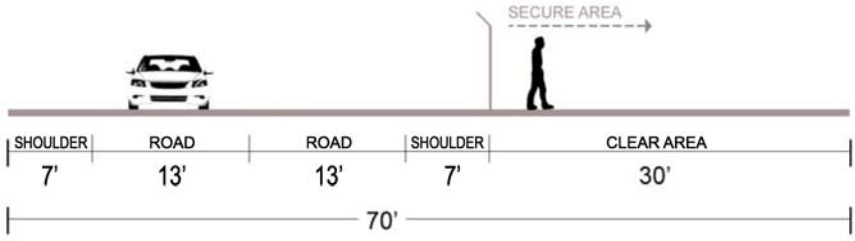
Section 2.4.1 provides a summary and rationale for the elimination of 14 out of 18 potential alignments from further consideration in this EIS using screening criteria defined in Table 2-3. The remaining four potential alignments, briefly summarized in Table 2-2, include the three "Route 34 North of the Main Gate" alignments and the "Route 34 South of the Main Gate" alignment. These four alignments meet the screening criteria defined in Table 2-3 and will be evaluated in selecting the preferred alternative. In addition to the four action alternatives, the No Action Alternative also will be evaluated. The following sections provide details about each of the alternatives, which have been renamed as Alternative Alignments 1, 2, 3, 4, and the No Action Alternative.

2.4.2.1 Alternative Alignment 1

General Description

Alternative Alignment 1 would access NWS Earle via a new entrance approximately 2,112 feet to the north of the main gate along Route 34 (Figure 2-1). This alignment measures approximately 3,379 feet from the Route 34 entrance to the Laurelwood and Stark Road housing areas. The alignment would require approximately 1,837 linear feet (LF) of new pavement and approximately 10,373 LF of new perimeter fence. The alignment would also require approximately 1,003 LF of road improvement to upgrade the access road to New Jersey standards for a residential highway.

The right-of-way for new road construction is assumed to be 70 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of one shoulder. One 30-foot clear area for security would be located outside the fence line within NWS Earle boundaries.



From the new entrance on Route 34 Alternative Alignment 1 would cross approximately 508 feet of wooded area before intersecting an existing sand road at the end of Green Drive. The alignment would continue east on the existing sand road for approximately 161 feet before crossing approximately 792 feet of wooded area and sand fields associated with a wastewater treatment plant. The alignment would then intersect an existing paved road. A treated water outfall pipe is located at the point where the road through the sand fields intersects the existing pavement.

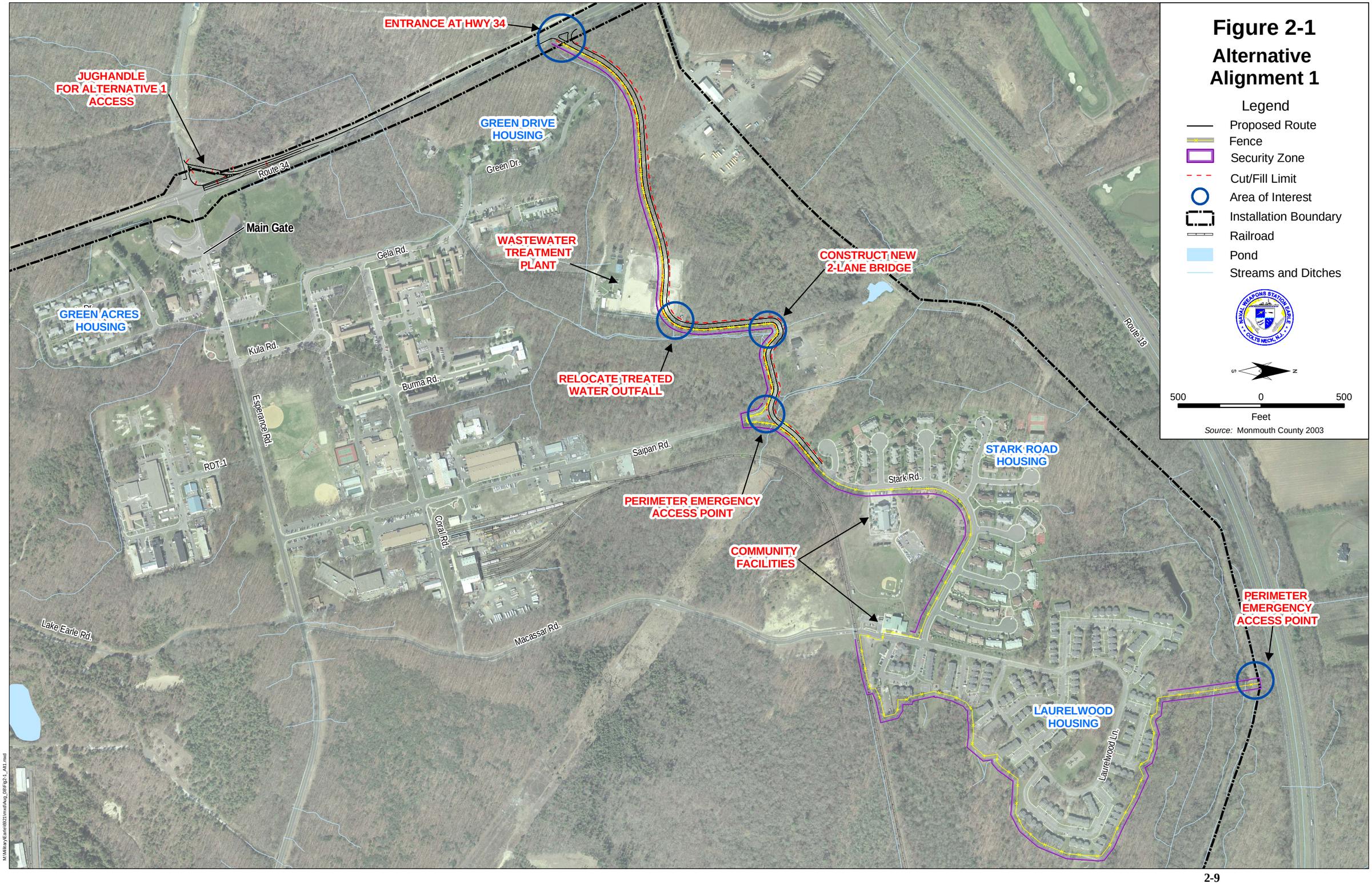


Figure 2-1
Alternative Alignment 1

Legend

- Proposed Route
- Fence
- Security Zone
- Cut/Fill Limit
- Area of Interest
- Installation Boundary
- Railroad
- Pond
- Streams and Ditches

500 0 500

Feet

Source: Monmouth County 2003

It is expected that the pipe and the oxygenation tank on the east side of the existing road would need to be relocated south of the alignment. The alignment would continue northeast for approximately 528 feet until crossing a one-lane bridge over Hockhockson Brook. The bridge would be expanded to two lanes in order to accommodate expected traffic from the Laurelwood and Stark Road housing areas.

From the bridge, the alignment would continue southeast for approximately 508 feet to intersect with Saipan Road. From this intersection the alignment would continue east on Saipan Road to reach the Laurelwood and Stark Road housing areas.

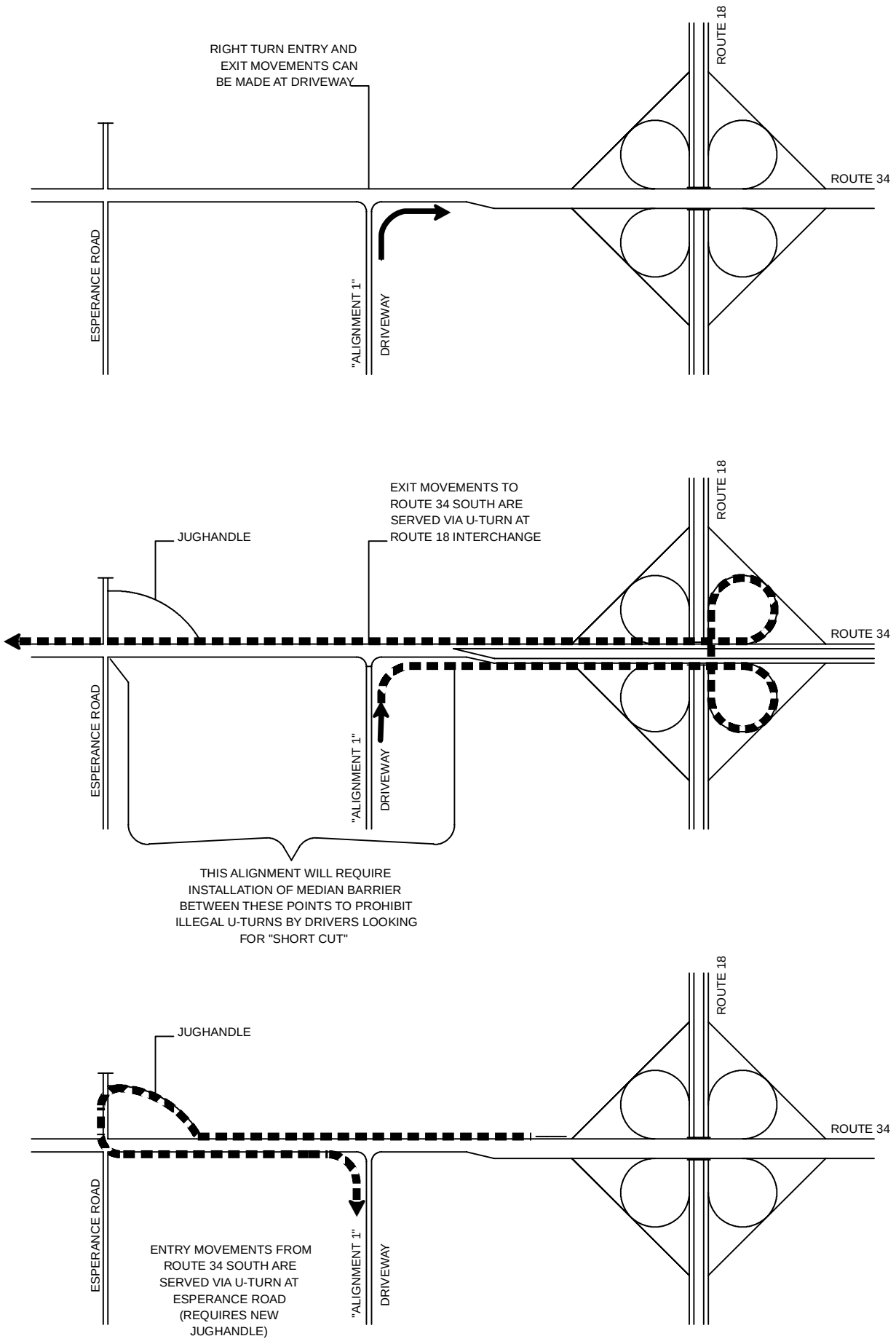
Security fencing would be installed along the south side of the entire length of the access road including the southern perimeter of the Laurelwood housing area. The community facilities located adjacent to Laurelwood/Stark Road would be located outside (south of) this fence line and be accessible to Navy personnel and their dependents. However, the existing driveway for the community facility along Stark Road would be eliminated; only the community facility along Macassar Road would have access from on-base. The Navy would need to provide access to both facilities. Provision of this access is not part of the proposed action evaluated in this EIS. The Navy would comply with all applicable laws and regulations prior to implementing the community facility access. Fencing would be constructed in accordance with accepted security standards for the installation. The fencing would essentially fence off the northern portion of the installation by connecting to the perimeter fence at Route 34 and at Route 18 on the north side of the Laurelwood housing area through an existing cleared sand road to the perimeter fence. Because of this security fencing requirement, the residents of Stark Road would be required to use this proposed new entrance and access road to enter and exit their housing units.

Two perimeter emergency access points would be installed along the alignment to allow emergency vehicles access to the housing area and the eastern portion of the perimeter road on the north side of the installation. Access could be controlled using a remote control or a security code.

Road and Intersection Design Requirements

Alternative Alignment 1 requires a new entrance from Route 34 approximately 2,112 feet north of the main gate entrance. During a meeting with NJDOT representatives on 23 August, 2007 the NJDOT identified preliminary design elements that would likely be required in order to gain approval for this alternative alignment.

The NJDOT staff indicated that this alignment would be acceptable as a “right-in, right-out” access working in concert with the existing loop ramps at the Route 18 interchange, and a potential new jughandle ramp at the existing Esperance Road traffic signal. This ingress/egress concept is illustrated on Figure 2-2.



M:\Military\Earle\6921\mxd\Fig2-2New.mxd

Figure 2-2
Alternative Alignment 1 Preliminary Intersection Design Elements

The requirement for a "right-in, right-out" access is due to the proximity of the proposed entrance to the Route 18 interchange. A median barrier is recommended between the Main Gate north to the acceleration/deceleration lanes at the Route 18/Route 34 interchange to prohibit left turns and u-turns out of the new entrance. Route 18 ramps would be used to accommodate the left-turn movements which would not be permitted at the new intersection. Acceleration and deceleration lanes on northbound Route 34 will likely be required pursuant to NJDOT design standards.

It was also noted that this access location would most likely preclude traffic signalization given the proximity to the Route 18 ramps. Therefore, the entrance would have to be relocated if, at some future date, development volume required a signal to reduce delays for traffic entering and exiting the Laurelwood housing area. The Navy prepared a traffic study (U.S. Navy 2008b) in 2008 that projected vehicle trips (daily and peak hours) and level of service following implementation of this alternative. The results of the study are discussed in Section 3.5, Section 4.5, and Appendix A. Data presented in the traffic study was consulted during the layout and engineering of the alternative alignments.

Traffic volumes at Route 34 and Esperance Road are expected to increase from implementation of this alternative primarily due to this intersection being near the proposed alignment entrance and the roadways to the north. The northbound Route 34 approach would require widening to incorporate a dedicated right-turn lane. In addition, the westbound Esperance Road approach would be modified to provide two through lanes, though it appears this can be accomplished with restriping and only minimal widening.

A portion of the existing paved road between the sand fields and the intersection with Saipan Road (approximately 1,003 feet) would be widened and upgraded to accommodate the additional traffic volumes estimated with this alignment. The current one-lane bridge over Hockhockson Brook would be replaced with an appropriately sized two-lane bridge to accommodate two-way traffic.

2.4.2.2 Alternative Alignment 2

General Description

Alternative Alignment 2 would access NWS Earle via a new entrance approximately 1,200 feet to the north of the main gate along Route 34 (Figure 2-3). This alignment measures approximately 3,590 feet from the Route 34 entrance to the Laurelwood and Stark Road housing areas. The alignment would require approximately 1,531 LF of new pavement and approximately 11,813 LF of new perimeter fence. The alignment would also require approximately 1,003 LF of road improvement to upgrade the access road to New Jersey standards for a residential highway.

Figure 2-3
Alternative Alignment 2

ENTRANCE AT HWY 34 AND TRAFFIC LIGHT
CULVERT
GREEN DRIVE HOUSING
Green Dr.
Route 34
Main Gate
Gela Rd.
WASTEWATER TREATMENT PLANT
CONSTRUCT NEW 2-LANE BRIDGE
Route 18
Kula Rd.
Burma Rd.
Esperance Rd.
RDT-1
RELOCATE TREATED WATER OUTFALL
Saipan Rd.
PERIMETER EMERGENCY ACCESS POINT
STARK ROAD HOUSING
Stark Rd.
Coral Rd.
COMMUNITY FACILITIES
Macassar Rd.
PERIMETER EMERGENCY ACCESS POINT
LAURELWOOD HOUSING
Laurelwood Ln.

Legend

- Proposed Route
- Fence
- Security Zone
- Cut/Fill Limit
- Area of Interest
- Installation Boundary
- Railroad
- Pond
- Streams and Ditches

NAVAL WEAPONS STATION EARLE COLTS NECK, N.J.

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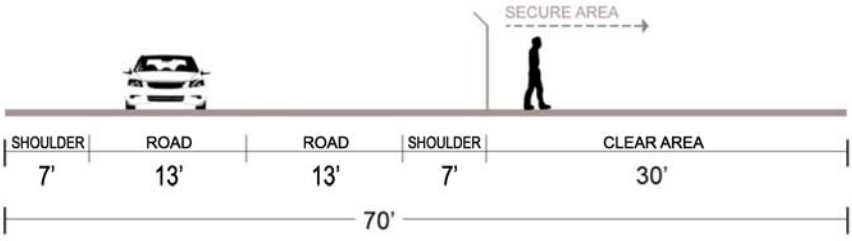
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Source: Monmouth County 2003

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The right-of-way for new road construction is assumed to be 70 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of one shoulder. A 30-foot clear area for security would be located outside the fence line within NWS Earle boundaries.



From the new entrance on Route 34, Alignment 2 would cross approximately 195 feet of wooded area before intersecting with Gela Road. The alignment would then follow Gela Road east until intersecting with Green Drive. The alignment would pass by each of the Officer housing units along Gela Road and Green Drive. The alignment would then follow Green Drive north to the end of the cul-de-sac and turn east onto an existing sand road. The sand road crosses a culvert carrying a tributary of Hockhockson Brook. From this point, Alternative Alignment 2 follows the same route to reach the Laurelwood housing area as described for Alternative Alignment 1.

Security fencing would be similar to that described for Alternative Alignment 1, except that security fencing would be installed along the south side of the entire length of the access road including the south/southeast side of the Green Drive housing area. The community facilities located adjacent to Laurelwood/Stark Road would be located outside (south of) this fence line and be accessible to Navy personnel and their dependents as described in Section 2.4.2.1 (Alternative Alignment 1). Because of this security fencing requirement, the residents of Stark Road and Green Drive would be required to use this new entrance and access road to enter and exit their housing units. Access to the mainside cantonment area would be through the main gate at Esperance Road.

Road and Intersection Design Requirements

Alternative Alignment 2 requires a new entrance from Route 34 approximately 1,200 feet north of the main gate entrance. General design elements for this proposed entrance were discussed with NJDOT representatives on 23 August, 2007 and are summarized below.

A traffic signal would be installed at Route 34 and the proposed alignment entrance in order to provide acceptable levels of service. Traffic volumes at this intersection will satisfy traffic signal warrants, although approval for a traffic signal has not been received by NJDOT. The following intersection configuration is assumed: Northbound—one through lane and one right-turn lane; Southbound—one through lane and one left-turn lane; Westbound (site exit)—one left-turn lane and one right-turn lane. Traffic volumes at Route 34 and Esperance Road are expected to increase from implementation of this alternative primarily due to additional volume generated from the proposed alignment entrance and the roadways to the north. The northbound Route 34

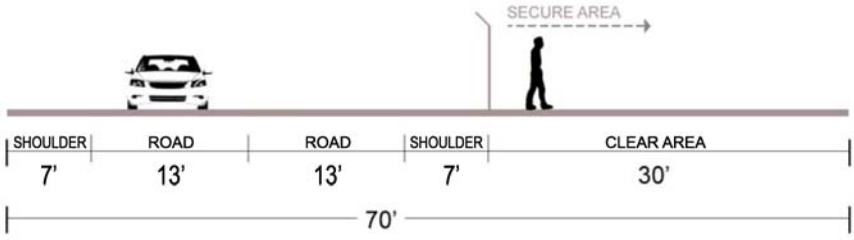
approach would be widened to provide a dedicated right-turn lane. In addition, the westbound Esperance Road approach may be modified to provide two through lanes, though it appears this can be accomplished with restriping and only minimal widening.

Remaining road and intersection design requirements would be the same as those required for Alternative Alignment 1.

2.4.2.3 Alternative Alignment 3

General Description

Alternative Alignment 3 would access NWS Earle via a new entrance approximately 1,200 feet to the north of the main gate along Route 34 (Figure 2-4). This alignment measures approximately 3,960 feet from the Route 34 entrance to the Laurelwood and Stark Road housing areas. The alignment would require approximately 195 LF of new pavement and approximately 11,038 LF of security fencing. The alignment would also require approximately 3,221 LF of road improvement to upgrade the access road to New Jersey standards for a residential roadway. The right-of-way for new road construction is assumed to be 70 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of one shoulder. A 30-foot clear area for security would be located outside the fence line within NWS Earle boundaries.



Alternative Alignment 3 would cross approximately 195 feet of wooded area before intersecting with Gela Road. The alignment would then follow Gela Road east, passing the intersection with Green Drive. The alignment would pass by one Officer housing unit on Gela Road.

The alignment would follow Gela Road for approximately 634 feet, passing by two NWS buildings inside the fence line (Buildings C-4 and C-27).

The alignment would continue northeast for approximately 2,059 feet, following the existing road around the wastewater treatment plant, and crossing a one-lane bridge over Hockhockson Brook. From this point, Alternative Alignment 3 follows the same route to reach the Laurelwood housing area as described for Alternative Alignments 1 and 2.

Figure 2-4
Alternative Alignment 3

ENTRANCE AT HWY 34 AND TRAFFIC LIGHT
GREEN DRIVE HOUSING
Green Dr.
Route 34
Bldg C-27
Main Gate
WASTEWATER TREATMENT PLANT
Bldg C-4
Gela Rd.
CONSTRUCT NEW 2-LANE BRIDGE
GREEN ACRES HOUSING
Kula Rd.
Burma Rd.
Esperance Rd.
RDT-1
Saipan Rd.
STARK ROAD HOUSING
Stark Rd.
Route 18
PERIMETER EMERGENCY ACCESS POINT
COMMUNITY FACILITIES
Coral Rd.
Macassar Rd.
PERIMETER EMERGENCY ACCESS POINT
LAURELWOOD HOUSING
Laurelwood Ln.

Legend

- Proposed Route
- Fence
- Security Zone
- Cut/Fill Limit
- Area of Interest
- Installation Boundary
- Railroad
- Pond
- Streams and Ditches

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Source: Monmouth County 2003

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Security fencing and access requirements for Stark Road and Green Drive housing areas would be similar to that described for Alternative Alignment 2, except that security fencing would include the south side of Gela Road as well as Buildings C-4, C-27, and the wastewater treatment plant. Access to Buildings C-4, C-27, and the wastewater treatment plant would be through the new entrance on Route 34 or through a perimeter emergency access point.

The community facilities located adjacent to Laurelwood/Stark Road would be located outside (south of) this fence line and be accessible to Navy personnel and their dependents as described in Section 2.4.2.1 (Alternative Alignment 1).

Road and Intersection Design Requirements

Road and intersection design requirements would be the same as those required for Alternative Alignment 2. However, the portion of existing paved road between Gela Road and the intersection with Saipan Road would need to be widened and upgraded to accommodate the additional traffic volumes estimated with this alignment.

2.4.2.4 Alternative Alignment 4

General Description

Alternative Alignment 4 would access NWS Earle via a new entrance approximately 1,742 feet to the south of the main gate along Route 34 (Figure 2-5). This alignment measures approximately 7,181 feet from the Route 34 entrance to the Laurelwood housing area.

The alignment would require approximately 3,900 LF of new pavement and approximately 21,897 LF of perimeter fence. The right-of-way for new road construction is assumed to be 100 feet; new road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders. Fencing along the road would be located within the right-of-way area on the outside of the shoulders. Two 30-foot clear areas for security would be located outside the fence line within NWS Earle boundaries.

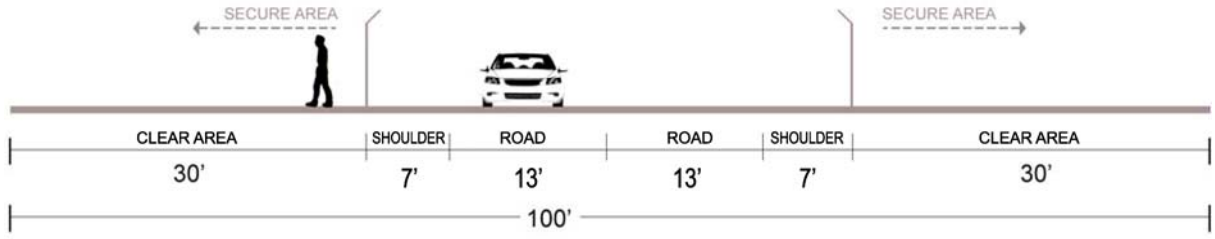


Figure 2-5
Alternative Alignment 4

ENTRANCE AT HWY 34

PERIMETER EMERGENCY ACCESS POINT

PERIMETER EMERGENCY ACCESS POINT

PERIMETER EMERGENCY ACCESS POINT

BRIDGE OVER ESPERANCE ROAD

PERIMETER EMERGENCY ACCESS POINT

GATES ON RAIL LINES

PERIMETER EMERGENCY ACCESS POINT

Main Gate

GREEN DRIVE HOUSING

GREEN ACRES HOUSING

STARK ROAD HOUSING

LAURELWOOD HOUSING

Route 34

Green Dr.

Gela Rd.

Blandy Dr.

Kula Rd.

Burma Rd.

Esperance Rd.

RDT-1

Saipan Rd.

Coral Rd.

Stark Rd.

Lake Earle Rd.

Macassar Rd.

Laurelwood Ln.

Legend

- Proposed Route
- Fence
- Security Zone
- Cut/Fill Limit
- Area of Interest
- Installation Boundary
- Railroad
- Pond
- Streams and Ditches

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Source: Monmouth County 2003

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Alternative Alignment 4 would cross approximately 50 feet of wooded area to connect with an existing sand road. The alignment would continue east on an existing sand road for approximately 1,742 feet and through approximately 200 feet of wooded area before intersecting with Lake Earle Road. The alignment continues northbound another 2,112 feet on Lake Earle Road to intersect with Esperance Road. Laurelwood traffic would access Macassar Road using a two-lane bridge/overpass over Esperance Road. After crossing Esperance Road, traffic would continue northbound on Macassar Road approximately 3,170 feet to intersect with the railroad crossing and then into the Laurelwood housing area.

Security fencing would be installed along both sides of the entire length of the access road, including Macassar Road and the perimeter of the Laurelwood housing area. Four perimeter emergency access points would be installed along the fence line between the Route 34 entrance and Lake Earle Road to allow fire/rescue personnel and security personnel access to the adjacent open space beyond the fence line.

A perimeter emergency access point would be installed at the intersection of Stark Road and Macassar Road to allow emergency vehicle access to Laurelwood. Gate access could be controlled using a remote control or a security code. Because this intersection would be closed except to allow security and fire/rescue personnel access to Laurelwood, a new access point to the community center along Macassar Road would be constructed. Provision of this access is not part of the proposed action evaluated in this EIS. The Navy would comply with all applicable laws and regulations prior to implementing the community facility access.

Alternative Alignment 4 would extend across the railroad track just south of the Laurelwood housing area. A set of gates would be incorporated into the fence to allow for periodic train traffic. It is expected that a security guard would be dispatched to open the gates and secure the opening as long as required for a train to cross the road. Traffic would be stopped during this time in the same fashion as occurs at all rail "at grade" crossings.

Road and Intersection Design Requirements

Alternative Alignment 4 requires a new entrance from Route 34 approximately 1,742 feet south of the main gate entrance. As mentioned above, this alignment requires approximately 3,900 LF of new road pavement. General design elements for this proposed entrance were discussed with NJDOT representatives on 23 August, 2007 and are summarized below.

A traffic signal warrant analysis was conducted as part of a traffic study (U.S. Navy 2008b) for this project. The study concluded that a signalized intersection would not be warranted for Alignment 4. Therefore, a full movement unsignalized intersection is proposed at Route 34. The following intersection configuration is assumed: Route 34 Northbound—dedicated right-turn lane and acceleration and deceleration lanes; Route 34 Southbound—dedicated left-turn lane; Westbound (site exit)—dedicated left-turn lane and right-turn lane.

In order to provide secure and uninterrupted east/west traffic flow on Esperance Road, Alternative Alignment 4 would be designed with a two-lane bridge connecting Macassar Road and Lake Earle Road. The bridge option would be designed to accommodate the largest vehicles that would potentially access Esperance Road (e.g. cranes, tractor trailers).

Other intersection design requirements would be the same as those required for Alternative Alignments 2 and 3.

2.4.2.5 No Action Alternative

The No Action Alternative maintains the status quo at NWS Earle. Under this alternative, an easement would not be provided to the developer of Laurelwood and an access road would not be constructed. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The Navy would be in breach of the lease agreement if unimpeded access is not provided at the termination of the in-lease period. Under this circumstance, the Navy would terminate the lease and compensate the developer in an amount equal to the developer's right to use or occupy the Laurelwood housing area for what would have been the remaining useful life of the housing (U.S. Navy 1988a).

The No Action Alternative is not a feasible alternative to the proposed action because it does not meet the purpose and need as described in Section 1.2. Nevertheless, CEQ regulations implementing NEPA (40 CFR 1500-1508) require that the No Action Alternative be carried forward for analysis in the EIS.

2.4.2.6 Preferred Alternative

Section 1502.14(e) of the CEQ regulations implementing NEPA requires that if an agency has a preferred alternative, that alternative should be identified in the EIS. After careful consideration of the potential impacts of the alternatives evaluated in this EIS in Chapter 4, the Navy has selected Alternative Alignment 4 as the preferred alternative.

In comparison to the other alternatives for meeting the purpose and need, implementation of Alternative Alignment 4 would result in the least impact to the operational capability of NWS Earle. Furthermore, Alternative Alignment 4 would not adversely affect the ability of NWS Earle personnel to effectively conduct daily operations and execute the installation's mission. Of the four alternatives considered in this EIS, only Alternative Alignment 4 allows existing military family housing areas and other facilities to remain within the secure fence line of the installation while also providing secure access for civilians to the Laurelwood housing area. Unlike the other three alternatives evaluated in this EIS, Alternative Alignment 4 would not separate military family housing and other facilities from the rest of the base by a new security fence.

Implementation of any of the four alternative alignments requires an access permit from the New Jersey Department of Transportation (NJDOT). Through written correspondence between the Navy and NJDOT representatives, the NJDOT identified Alternative Alignment 4 as their preferred alternative for access to Route 34.

Alternative Alignment 4 would result in the least amount of permanent impact to wetlands and wetland transition areas. Alternative Alignment 4 does not impact architectural or archaeological resources. In-water construction would not be required for this alternative; therefore, impacts to Hockhockson Brook and its tributaries would not occur.

2.4.2.7 Comparison of Alternatives

Chapters 4, 5, and 6 provide detailed analysis of environmental impacts of all four action alternatives and the No Action alternative. Table 2-4 provides a summary of environmental consequences of the alternatives analyzed in this EIS by resource area. For further details, see the analysis provided in Chapters 4, 5, and 6 of this EIS.

Table 2-4 Comparison of Alternative Impacts

Resource	Alternative	Potential Impacts/Effects
Land Use	Alternative 1	Minor effects due to decreased functionality relative to other portions of the base south of Green Drive housing area and all of Stark Road housing areas. Secluded residential character of Green Drive community would be affected by new road. Potential mitigation to offset impact at Green Drive could involve planting native screening vegetation. Residents of Stark Road housing area would be segregated from remainder of Station.
	Alternative 2	Same as described for Alternative 1, except all of Green Drive housing would be impacted as alignment passes directly in front of the housing. Both Green Drive and Stark Road housing areas would be segregated from the remainder of the Station.
	Alternative 3	Same as described for Alternatives 1 & 2, except road passes between the two houses at the south end of Green Drive. In addition, Buildings C-27, C-4, and wastewater treatment plant would be located outside of fence line, reducing functionality with administrative and support facilities at mainside.
	Alternative 4	No appreciable effects anticipated.
	No Action	No impacts expected.
Socioeconomics	Alternative 1	Construction would result in short-term influx of jobs and expenditures in the area. Total regional economic impact would be estimated at $7.126 million in industry input, 50.2 full- or part-time temporary jobs, and $4.182 million in value-added economic impact. Colts Neck population would increase (estimated 7.4% over 2006 levels). Due to proximity, there would be new interactions among civilian and military families, particularly those at Stark Road.
	Alternative 2	Construction would result in short-term influx of jobs and expenditures in the area. Total regional economic impact would be estimated at $8.723 million in industry input, 61.5 full- or part-time temporary jobs, and $5.120 million in value-added economic impact. Colts Neck population would increase (estimated 7.4% over 2006 levels). Due to proximity, there would be new interactions among civilian and military families, particularly those at Stark Road.
	Alternative 3	Construction would result in short-term influx of jobs and expenditures in the area. Total regional economic impact would be estimated at $6.490 million in industry input, 45.7 full- or part-time temporary jobs, and $3.809 million in value-added economic impact. Colts Neck population would increase (estimated 7.4% over 2006 levels). Due to proximity, there would be new interactions among civilian and military families, particularly those at Stark Road.
	Alternative 4	Construction would result in short-term influx of jobs and expenditures in the area. Total regional economic impact would be estimated at $16.406 million in industry input, 115.6 full- or part-time temporary jobs, and $9.629 million in value-added economic impact. Colts Neck population would increase (estimated 7.4% over 2006 levels).
	No Action	No impacts expected.
Community Facilities and Services	Alternative 1	Significant impacts anticipated at Mahala F. Atchison Elementary School, Swimming River Elementary School, and Tinton Falls Middle School from increased number of school-age children. Specific impacts include physical capacity issues, class size increases, additional school bus costs, and potential need for additional faculty. No significant impacts to law enforcement, fire and medical services, or recreation resources are anticipated. Minor increase in use of local community recreational resources.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.
Utilities	Alternative 1	Utility demands would increase over existing levels at NWS Earle. However, no significant impacts to the provision of utilities are anticipated. Minor upgrades to utility infrastructure in Laurelwood may be required. Efficiency of water distribution system and wastewater treatment plant would improve due to increased throughput volume.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected. However, water distribution system and wastewater treatment plant would continue to function at less than optimal levels.

Table 2-4 Comparison of Alternative Impacts (Continued)

Resource	Alternative	Potential Impacts/Effects
Traffic and Transportation	Alternative 1	Localized short-term on-station impacts to traffic during construction period. Minor impacts to Stark Road and Green Drive residents would result from additional vehicle trips associated with Laurelwood housing area. Minor impact to Route 34 and Colts Neck Road intersection.
	Alternative 2	Same as Alternative 1. In addition, a moderate impact is expected in the form of a slight degradation in LOS for the northbound Route 34 approach to alignment entrance. This impact could be offset through signal timing adjustment at the Route 34/Esperance Road traffic signal. Minor impact to Route 34 and Colts Neck Road intersection.
	Alternative 3	A moderate impact is expected in the form of a slight degradation in LOS for the northbound Route 34 approach to alignment entrance. This impact could be offset through signal timing adjustment at the Route 34/Esperance Road traffic signal. Minor impact to Route 34 and Colts Neck Road intersection.
	Alternative 4	Localized short-term on-station impacts to traffic during construction period. A minor impact is expected in the form of delays at the intersection of Route 34 and Esperance Road. This impact could be offset by a dedicated northbound right-turn lane and separate left- and right-turning lanes. Minor impact to Route 34 and Colts Neck Road intersection.
	No Action	No impacts expected.
Air Quality	Alternative 1	Short-term construction-related air emission increases would occur. Estimates of these emission levels are insignificant.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.
Noise	Alternative 1	Minor, short-term noise impacts would occur during construction. Minor indirect impacts due to traffic noise associated with additional vehicle trips are expected.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.
Cultural Resources	Alternative 1	No effect to cultural resources would occur. Navy has completed consultation with New Jersey SHPO (see Appendix D).
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.
Geology, Topography, and Soils	Alternative 1	Minor short- and long-term impacts from roadway construction are expected. Approximately 4.4 acres of soil disturbance. These minor impacts would be mitigated by the use of best management practices for erosion control.
	Alternative 2	Minor short- and long-term impacts from roadway construction are expected. Approximately 5.7 acres of soil disturbance. These minor impacts would be mitigated by the use of best management practices for erosion control.
	Alternative 3	Minor short- and long-term impacts from roadway construction are expected. Approximately 4.7 acres of soil disturbance. These minor impacts would be mitigated by the use of best management practices for erosion control.
	Alternative 4	Minor short- and long-term impacts from roadway construction are expected. Approximately 9.2 acres of soil disturbance. These minor impacts would be mitigated by the use of best management practices for erosion control. Approach ramp and abutment for Esperance Road bridge would result in long-term alteration impacts due to grading, cut/fill, berm construction, and backfilling.
	No Action	No impacts expected.
Vegetation	Alternative 1	Minor impacts to vegetation are expected, including introduction of non-native invasive plants, changes in light, temperature, and hydrology, and damage from road treating chemicals. Measures to offset these minor impacts could include minimizing clearing to extent practicable and use of native plants for ground stabilization and roadside plantings.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.

Table 2-4 Comparison of Alternative Impacts (Continued)

Resource	Alternative	Potential Impacts/Effects
Wildlife	Alternative 1	Minor impacts due to habitat loss, habitat alteration, and noise would be expected. Impacts to terrestrial wildlife may occur due to restriction of movement by new fencing. Increased mortality of terrestrial wildlife could occur due to vehicle collisions. No direct or indirect effects to state- or federally-listed threatened or endangered species would occur.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.
Surface Water and Groundwater	Alternative 1	Requires widening bridge over Hockhockson Brook, a trout maintenance stream. Best management practices would be incorporated during construction to minimize potential erosion, runoff, and sedimentation. Therefore, no impacts to trout downstream of NWS Earle or other off-site water bodies are anticipated. 1.7 acres of new impervious surface over groundwater aquifer.
	Alternative 2	Same as described for Alternative 1 except Alternative 2 also includes the widening of an existing culvert on a small tributary of Hockhockson Brook. 1.9 acres of new impervious surface over groundwater aquifer.
	Alternative 3	Same as described for Alternative 2. 1.0 acres of new impervious surface over groundwater aquifer.
	Alternative 4	No surface water impacts expected. 1.8 acres of new impervious surface over groundwater aquifer.
	No Action	No impacts expected.
Floodplains	Alternative 1	FEMA floodplains have not been mapped at NWS Earle. Alternative 1 crosses a USGS-designated flood-prone area at its intersection with Gela Road at the wastewater treatment plant, continuing to the intersection of Saipan Road to boundary of Stark Road housing area. A portion of the jughandle encumbers a flood-prone area.
	Alternative 2	Same as described for Alternative 1 with the exception of the jughandle which is not part of Alternative 2.
	Alternative 3	Same as described for Alternative 1 and also crosses a USGS-designated flood-prone area along Gela Road, just east of Green Drive.
	Alternative 4	Crosses a USGS-designated flood-prone area at the power line right-of-way along Macassar Road.
	No Action	No impacts expected.
Wetlands	Alternative 1	Approximate permanent impact: 2.03 acres. Approximate transition area impact: 9.75 acres.
	Alternative 2	Approximate permanent impact: 2.13 acres. Approximate transition area impact: 9.68 acres.
	Alternative 3	Approximate permanent impact: 2.22 acres. Approximate transition area impact: 7.18 acres.
	Alternative 4	Approximate permanent impact: 1.31 acres. Approximate transition area impact: 6.62 acres.
	No Action	No impacts expected.
The Navy would pursue appropriate permits with NJDEP and a determination would be made regarding mitigation requirements for impacted wetlands and transition area.		
Environmental Health and Safety	Alternative 1	No impacts expected.
	Alternative 2	No impacts expected.
	Alternative 3	No impacts expected.
	Alternative 4	Bisects delineated boundaries of IR Site 1. Land use controls for this site are in place. A portion of this alternative is encumbered by two explosive safety quantity distance arcs. If selected, NWS Earle would take the steps necessary steps such that these arcs no longer encumber the alignment.
	No Action	No impacts expected.
Security	Alternative 1	Alternative 1 would not compromise the security posture at NWS Earle.
	Alternative 2	Same as described for Alternative 1.
	Alternative 3	Same as described for Alternative 1.
	Alternative 4	Same as described for Alternative 1.
	No Action	No impacts expected.

3 EXISTING ENVIRONMENT

This chapter describes relevant existing conditions for resources potentially affected by the proposed action and alternatives described in Chapter 2. Information presented in this section represents the environmental baseline against which the proposed action is compared in Chapter 4. In accordance with NEPA and CEQ guidelines, this chapter discusses the existing condition of the human and natural environment that potentially could be affected, beneficially or adversely, by the alternatives. Descriptions of the affected environment are provided for the following resources: Land Use, Socioeconomics, Community Services and Facilities, Utilities, Traffic, Air Quality, Noise, Cultural Resources, Geology, Topography, Soils, Biological Resources, Water Resources, Environmental Health and Safety, and Security. The following sections provide a definition of each resource and a description of the associated region of influence (ROI) in which potential impacts could occur. The ROI is the geographic extent that is being evaluated for a particular resource.

3.1 LAND USE

Land use refers to modification of land for human purposes. Land use primarily serves human habitation and economic purposes, but it also includes lands that are set aside for recreation and conservation purposes. The attributes of land use include patterns of land jurisdiction, land ownership, and the types of activities that occur on lands (agriculture, residences, industries, recreation, etc.). Within NWS Earle, land use planning occurs in accordance with Navy policies and guidance. On lands adjacent to NWS Earle, land uses are regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable.

This discussion focuses on those aspects of land use that are potentially affected by the proposed action and alternatives. These locations include the Laurelwood housing area, the areas that the proposed routes for unimpeded access to the Laurelwood housing area would intersect, and areas adjacent to the aforementioned locations. These areas are located in the north-central portion of mainside NWS Earle, which is southeast of the intersection of Route 34 and Route 18 (see Figure 1-2). The northernmost point of the Laurelwood housing area is approximately 300 feet south of the NWS Earle boundary and approximately 500 feet south of Route 18. Because the proposed action does not have the potential to affect off-Station land use, off-Station land use is analyzed in less detail, primarily to provide context.

3.1.1 On-Station Land Use

3.1.1.1 Laurelwood Housing Area

The land use at the Laurelwood housing area is family housing. The 300-unit multiplex-style town home development is owned and operated by the developer that constructed the units in 1988. The majority of the units (68 percent) are two-bedroom units; 20 percent are three-bedroom units, and 12 percent are four-bedroom units. A tight network of roads and street side parking serves the area. Recreation/open space features integrated with the development include

ten small playgrounds, one tennis court, and four basketball courts (McCaffrey 2007a). A wooded open area is in the center of the housing area and the north, east, and southern edges of the housing area are surrounded by forested areas. The western edge of the Laurelwood housing area abuts the Stark Road housing area. The Stark Road housing area currently houses the majority of military housing residents at NWS Earle (see Table 1-3) and is expected to serve this role into the future (see Table 1-5). Stark Road provides access to this housing area; the Stark Road housing units are aligned along eight streets that terminate in cul-de-sacs. Demolition and renovation of housing units at Stark Road was completed in 2008.

3.1.1.2 Areas Bisected by Road Alignment Alternatives

Land use in the mainside area of NWS Earle consists of a relatively compact assemblage of administrative and community support facilities primarily located north of Esperance Road. Community support facilities include the Navy Exchange (NEX), bank/credit union, gym, pool, and cybercafé. Housing areas are located in areas near the mainside administrative and community support facilities (see Figure 1-2). Green Acres and Green Drive housing areas are located adjacent to Route 34, west of the mainside administrative area and south and north of the main gate, respectively. Stark Road and Laurelwood housing areas are located northeast of the mainside administrative and support facilities.

Each of the four alternative alignments would provide unimpeded access to Laurelwood housing area from Route 34. Land uses between Route 34 and Laurelwood housing area potentially affected by development of the unimpeded access include the following.

- Route 34: all alternative alignments would include the establishment of a new access point along Route 34. Land use along Route 34 for all alternative access points includes the existing right-of-way for the highway and wooded areas to the east of the highway.

- Green Drive Housing Area: Alternative Alignments 1, 2, and 3 would include portions of existing roads that provide access to the housing area from the NWS Earle interior and wooded areas between these existing roadways and Route 34.

- Between Green Drive and Stark Road Housing Areas: Alternative Alignments 1, 2, and 3 through this area would traverse wooded areas, an existing sand roadway, inactive sand fields associated with the wastewater treatment plant, and the treated water outfall point (see Section 2.4.2.1 and Figures 2-1, 2-3 and 2-4).

- South and east of developed areas at mainside NWS Earle: with Alternative Alignment 4, wooded areas having some level of prior disturbance would be traversed and there would be a new intersection with Esperance Road. The southeast corner of the Stark Road housing area, which includes a community center, would potentially be affected.

- North of Laurelwood housing area to Route 18: under Alternative Alignments 1, 2, and 3, a new perimeter emergency access point and fencing would be installed in this area (see Figures 2-1, 2-3, and 2-4). Existing land use consists of existing sand roads (the installation perimeter and intervening sand road) and surrounding wooded area.

- Laurelwood housing area perimeter: under Alternative Alignments 1, 2, and 3, the eastern edge of the housing area would be fenced and under Alternative Alignment 4, all of the housing area would be fenced. Land use at the perimeter of the housing area is wooded/open space.

3.1.2 Off-Station Land Use

The Laurelwood housing area at NWS Earle is located within the geographic boundaries of the Colts Neck Township. The Colts Neck Township Master Plan encourages agriculture and low-density housing. The Master Plan acknowledges that NWS Earle is outside of the Township's planning and zoning authority. Nevertheless, land use and zoning is mapped and evaluated for NWS Earle. Land use at NWS Earle is categorized by the Colts Neck Township as primarily wooded area, with the developed areas, including Laurelwood housing area, categorized as landscaped-commercial/industrial. In the event the land underlying NWS Earle were to revert to non-federal ownership, it would presumably be designated as part of the Township's agricultural district. The Township's plan for agricultural areas is to promote agriculture and retain farmland by utilizing planning and innovative land conservation techniques, protecting the economic vitality of the agricultural industry, and advising residents on the benefits and special needs of agriculture (Colts Neck Township 2004).

The area off-Station just north of NWS Earle is primarily undeveloped and, with the exception of Route 18, is categorized as wooded in the Colts Neck Township Master Plan. A golf course is located to the northwest of the Laurelwood and Stark Road housing areas on the north side of Route 18. Route 18 is categorized as landscaped-commercial/industrial. This area is zoned as part of the Township's agricultural district.

3.1.3 Coastal Zone Management

Pursuant to the Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. § 1451), the State of New Jersey prepared a Federally-approved Coastal Management Program (CMP). Section 307(c) (16 U.S.C. 1456c) of the CZMA requires that any federal activity that directly or indirectly affects any land or water use or natural resource of the coastal zone be consistent to the maximum extent practicable with the enforceable policies of the state’s approved CMP. In New Jersey, the enforceable policies are contained in the Coastal Zone Management Rules (New Jersey Administrative Code [N.J.A.C.] 7:7E), the Coastal Permit Program Rules (N.J.A.C. 7:7), and the Freshwater Wetlands Protection Act (FWPA) Rules (N.J.A.C. 7:7A). Three major state laws are implemented through the Coastal Zone Management Rules: the Waterfront Development Law (N.J.S.A. 12:5-3), the Wetlands Act of 1970 (N.J.S.A. 13:9a), and the Coastal Area Facility Review Act (CAFRA) (N.J.S.A. 13:19). The Hackensack Meadowlands

Reclamation and Development Act (N.J.S.A. 13:17 et seq.) and rules are additional authorities for Federal Consistency review.

In 1973, the State of New Jersey passed CAFRA. This legislation established the coastal zone boundaries for portions of the southern part of the State. The CAFRA area begins where the Cheesequake Creek enters Raritan Bay in Old Bridge, Middlesex County. It extends south along the coast around Cape May, and then north along the Delaware Bay ending at the Kilcohook National Wildlife Refuge in Salem County. The inland limit of the CAFRA area follows an irregular line drawn along public roads, railroad tracks, and other features. The CAFRA area varies in width from a few thousand feet to 24 miles, measured straight inland from the shoreline. Parts of the coastal zone run through Monmouth County, one of New Jersey's coastal counties identified by CAFRA. The remainder of New Jersey's coastal zone is defined within the Coastal Zone Management Rules. They identify the existing sensitive ecosystems within the zone, highlight potential threats resulting from development, and outline programs designed to manage and protect this sensitive area. In New Jersey the coastal zone program is administered by the New Jersey Department of Environmental Protection (NJDEP).

Excluded from the coastal zone are lands the use of which is by law subject solely to the discretion of or which is held in trust by the federal government, its officers or agents. Therefore, all of NWS Earle is outside the defined coastal zone. However, there is a small portion of the NWS Earle's Waterside area that would be located within New Jersey's coastal zone as defined by CAFRA. The area at mainside where the proposed action would take place is approximately 5.75 miles outside the CAFRA defined coastal zone.

3.2 SOCIOECONOMICS

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and industrial growth, but the socioeconomic analysis takes a broader look at how the potentially affected population lives, works, plays, relates to one another, organizes to meet their needs, and generally functions as a society. Although some data on educational attainment is provided herein, schools are addressed in Section 3.3, Community Facilities and Services.

The ROI for socioeconomics is defined as the area in which the principal effects arising from implementation of the proposed action or alternatives are likely to occur. The Laurelwood housing area lies within Colts Neck Township; however, military children who live in military housing at NWS Earle currently attend Tinton Falls Borough schools.

Therefore, for this EIS, the ROI for socioeconomics was defined as Colts Neck Township and Tinton Falls Borough. Figure 3-1 depicts the socioeconomics ROI. This ROI is within and interrelated with the socioeconomics of Monmouth County, New Jersey. To provide context, data and analysis is provided for Monmouth County, for New Jersey, and for the U.S.

3.2.1 Overview

Both Colts Neck and Tinton Falls are bedroom communities to the nearby New York City metropolitan area. Monmouth County is part of the U.S. Census Bureau-designated Consolidated Metropolitan Statistical Area of New York-Northern New Jersey-Long Island, NY-NJ-CT-PA. While both are suburban areas, Colts Neck is a particularly rural area in the region, with a population density of 392 persons per square mile. The population density of Tinton Falls is 966 persons per square mile. In comparison, the population density in Monmouth County is 1,304 persons per square mile; in New Jersey, it is 1,135 persons per square mile; and in the U.S., it is 80 persons per square mile (U.S. Census Bureau 2007a).

Population growth has been dramatic over recent decades, particularly in Tinton Falls; however, Colts Neck experienced a decrease in population between 2000 and 2006. The demographic data show that the population is predominantly White, with high levels of educational attainment, and income (particularly in Colts Neck). Migration data, high rates of homeowner occupancy, and diversity in employment sectors indicate community stability. In Colts Neck, single-family homes predominantly have four or more bedrooms; in Tinton Falls, two- to three-bedroom homes are more common. Most homes in Tinton Falls were constructed in the 1980s and most homes in Colts Neck were constructed in the 1960s. The economic impact of NWS Earle is moderate within the context of the economy of the ROI. State/local taxes are higher in New Jersey than the average in U.S. and New Jersey's combined per capita property taxes are the highest in the nation. The average residential property taxes in Colts Neck are 45 percent higher than the statewide average, while average residential property taxes in Tinton Falls are 15 percent lower than the statewide average.

3.2.2 Demographics

3.2.2.1 Population and Population Growth

Table 3-1 presents population data for the ROI, Monmouth County, New Jersey, and the U.S. for 1980, 1990, 2000, and 2006. The population of NWS Earle is reported in the Colts Neck Township estimates. In 2006, the population of Monmouth County was estimated at 635,285. At a 2006 population of 11,587, Colts Neck comprises less than 2 percent of the county population. Tinton Falls, which has a 2006 population of 17,082, comprises less than 3 percent of the county population. The growth rate of the ROI from 1980 to 2006 is greater than that of Monmouth County, New Jersey, and the U.S. as a whole. While the population of Monmouth County grew 26 percent during this time period, the population of Colts Neck has increased by 47 percent and the population of Tinton Falls increased by 121 percent.

The 60 percent growth rate of Tinton Falls Borough in the 1980s is notable in that it far exceeded growth rates for other areas during that decade. Additionally, it is notable that the population of Colts Neck declined 6 percent from 12,331 in 2000 to 11,587 in 2006, the only declining trend over the 36-year period.

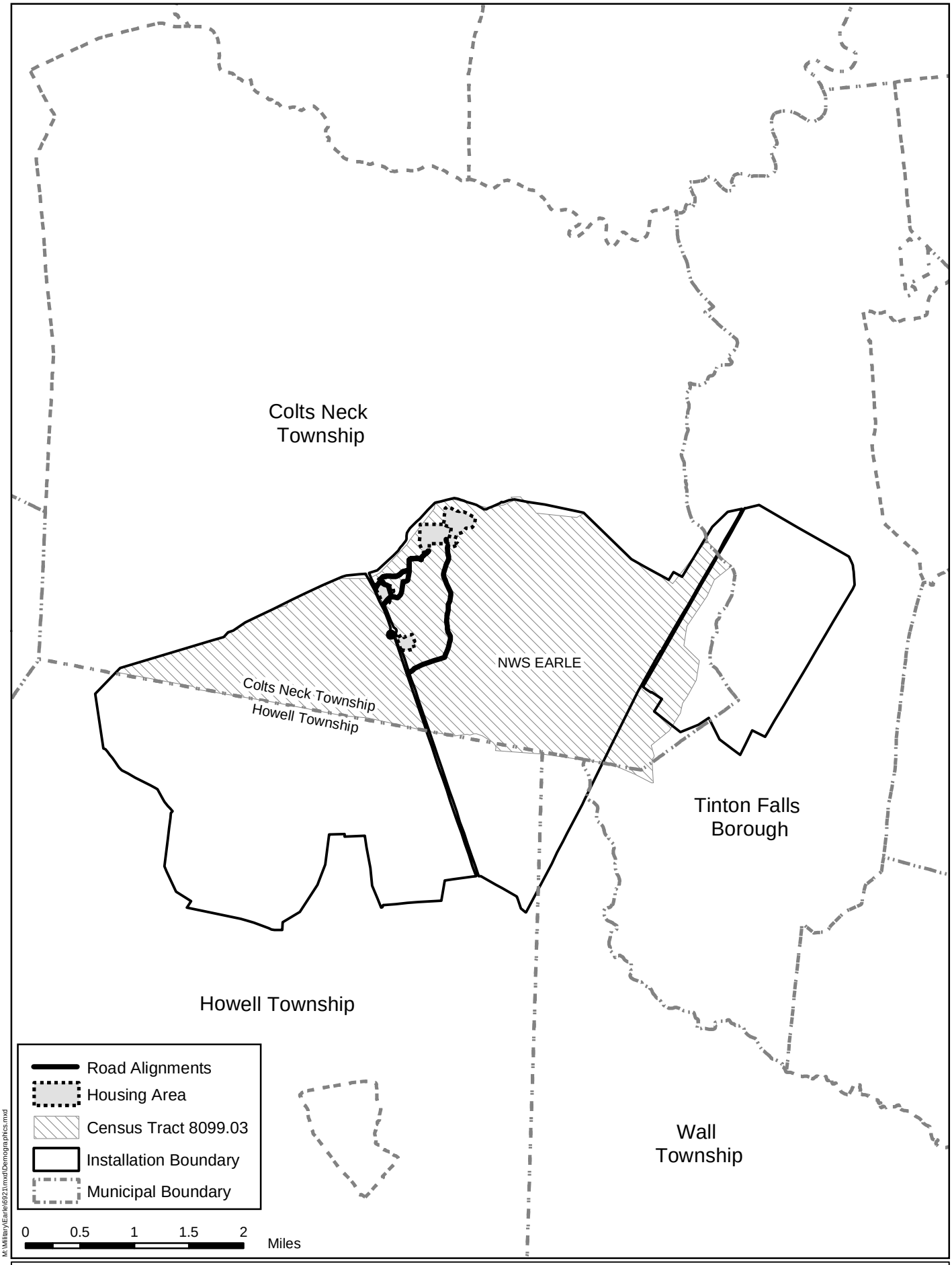
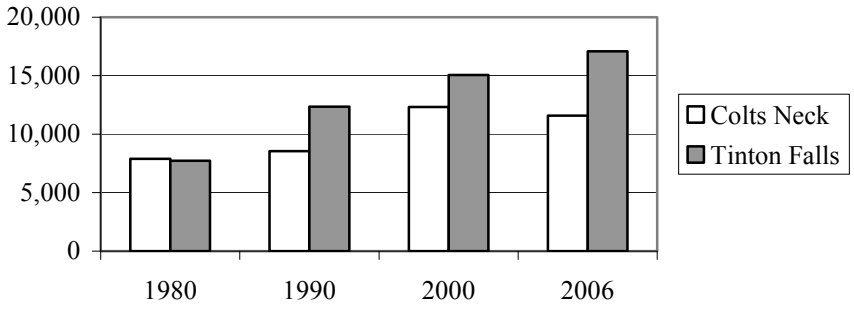


Figure 3-1
Socioeconomic Study Area

Table 3-1 Population Trends (1980-2006)

Locality	1980	1990	2000	2006	Percent Change			
					1980-1990	1990-2000	2000-2006	1980-2006
U.S.	226,542,199	248,709,873	281,421,906	291,332,841	+10	+13	+4	+29
New Jersey	7,365,011	7,730,188	8,414,350	8,724,560	+5	+9	+4	+18
Monmouth County	503,173	553,124	615,301	635,285	+10	+11	+3	+26
Colts Neck Township	7,888	8,559	12,331	11,587	+9	+44	-6	+47
Tinton Falls Borough	7,740	12,361	15,053	17,082	+60	+22	+13	+121

Graphical Representation of Population Growth in ROI (1980-2006)



Source: U.S. Census Bureau 1993, 2007b, 2007c, 2007d

The military population at NWS Earle increased dramatically in the 1990s and then, as shown in Table 3-2, decreased steadily through fiscal year 2007. Naval Weapons Station Earle accounts for 12 percent of the growth of Colts Neck in the 1990s (Colts Neck Township 2004) and much of the decrease in population between 2000 and 2006.

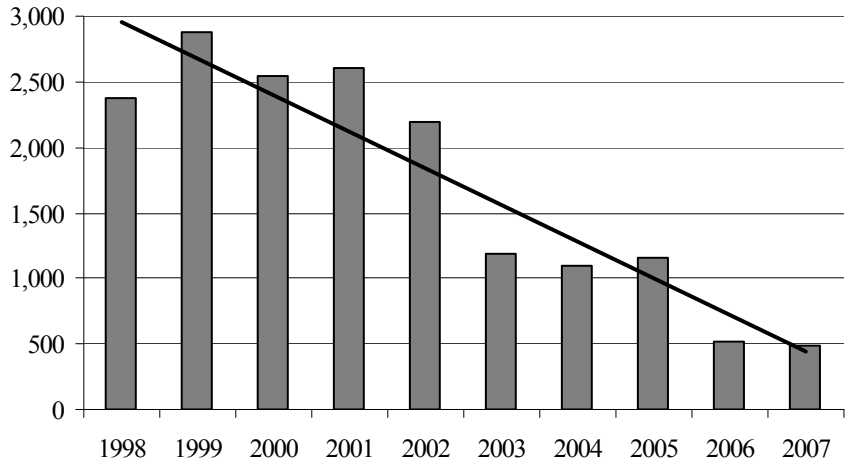
The population projection for 2025 for Monmouth County is 694,189 (Monmouth County Planning Board 2007). This would be a 9 percent increase from 2000 to 2025. The population of Colts Neck is projected to increase at a lesser rate than that of Monmouth County (to 12,447 by 2025, a 7.4 percent increase from the 2006 population estimate). Conversely, the population of Tinton Falls is projected to increase at more than twice the rate of Monmouth County. The 2025 population projection for Tinton Falls, at 20,659, would be a 20.9 percent increase from the 2006 population estimate (Monmouth County Planning Board 2006).

Data on the components of population change is available for Monmouth County, but not for Tinton Falls and Colts Neck. Based on the county-wide data, nearly half of the growth in the 1990s was attributed to net natural increase (excess of births to deaths) as opposed to migration. Domestic migration was a greater factor in the 1990s than international in-migration. Since 2000, 75 percent of population growth in the county is attributed to net natural increase. Net migration is due to international in-migration; domestic out-migration is in excess of domestic in-migration (U.S. Census Bureau 2007e).

Table 3-2 NWS Earle Military Strength (1998-2007)

Fiscal Year	Officer	Enlisted	Total	Percent Change
1998	192	2,189	2,381	
1999	203	2,679	2,882	+21.0
2000	183	2,357	2,540	-11.9
2001	183	2,422	2,605	2.6
2002	172	2,016	2,188	-16.0
2003	91	1,096	1,187	-45.7
2004	89	1,013	1,102	-7.2
2005	86	1,078	1,164	5.6
2006	51	467	518	-55.5
2007	53	427	480	-7.3

Graphical Representation of NWS Earle Military Strength (1998-2007)



Source: U.S. Navy 2008a

As shown in Table 3-3, data are available regarding patterns of residential change between 1995 and 2000 for the municipalities. These data indicate that Tinton Falls mirrors the U.S. in this measure of migration. In comparison, Colts Neck has a higher percentage of residents who have not moved since 1995 (59 percent as compared to 24 percent for Tinton Falls) and fewer residents that moved to Colts Neck from another location in Monmouth County (13 percent as compared to 24 percent for Tinton Falls). The portion of Colts Neck population that is at NWS Earle accounted for approximately 44 percent of all of those that reported being in a different house in 1995.

The median age in Colts Neck in 2000 was 33.2, while Tinton Falls was 36.8 (U.S. Census Bureau 2007b). The nationwide median age in 2000 was 35.3. The median age in Monmouth County in 2000 was notably higher, at 37.7. The trend has been an increasingly higher median age for the county. In 1990, the median age was 35.0 and in 2006, the median age for Monmouth County was 39.8 years (Monmouth County Planning Board 2007).

Table 3-3 Migration Patterns From 1995 - 2000

Geographic Area	Same House in 1995		Different House in 1995		Different House in 1995 (Within the Same County)	
	Number	%	Number	%	Number	%
U.S.	142,027,478	54	120,347,674	46	65,435,013	25
New Jersey	4,697,484	60	3,158,784	40	1,628,378	21
Monmouth County	350,530	61	222,773	39	114,670	20
Colts Neck Township	6,335	59	4,959	44	1,438	13
Tinton Falls Borough	7,506	54	6,353	46	3,369	24

Source: U.S. Census Bureau 2007f

3.2.2.2 Race and Ethnicity

Table 3-4 provides the detailed race and ethnicity data for the ROI from the 2000 Census and Table 3-5 provides the estimates of race and ethnicity for 2006, although 2006 data from the Census for Tinton Falls and Colts Neck is not available. The diversity of racial composition in the ROI is less than that of New Jersey and the U.S. Within the ROI, the majority of the population is White (85.6 percent in Colts Neck and 78.8 percent in Tinton Falls), followed by Black or African American (7.9 percent in Colts Neck and 12.9 percent in Tinton Falls). The County-wide race and ethnicity breakdown is closely aligned with Colts Neck. In comparison to Monmouth County, both Colts Neck and Tinton Falls have a smaller percentage of residents who are of Hispanic or Latino decent. From 2000 to 2006 in Monmouth County, the percentage of White and Black or African American residents of the total population has decreased, while the Asian, Native Hawaiian, and Other Pacific Islanders population has increased by 36.4 percent. Residents of Monmouth County of Hispanic or Latino decent have increased by 34.9 percent from 2000 to 2006 (see Table 3-4 and Table 3-5).

Table 3-4 Race and Ethnicity (2000)

Geographic Area	White		Black or African American		American Indian and Alaska Native		Asian, Native Hawaiian, and Other Pacific Islanders		Some Other Race		Hispanic or Latino (of any race)[1,2]	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
U.S.	211,353,725	75.1	34,361,740	12.2	2,447,989	0.8	10,550,602	3.7	22,707,850	8.0	35,238,841	12.5
New Jersey	6,099,439	72.5	1,127,266	13.4	17,987	0.2	484,503	5.7	685,155	8.1	1,116,149	13.4
Monmouth County	519,940	84.5	48,883	7.9	769	0.1	24,234	3.9	21,475	3.5	38,076	6.2
Colts Neck Township	10,552	85.6	974	7.9	28	0.2	519	4.2	258	2.1	499	4.1
Tinton Falls Borough	11,863	78.8	1,949	12.9	20	0.1	797	5.3	426	2.8	749	4.9

Notes: [1] The Hispanic population is not a racial category and includes components in each of the five racial categories (i.e. Hispanic figures cannot be added to racial categories to reach total population figure; double counting would result)
[2] Race statistics presented in this table will not add to 100 percent for two reasons: 1) a small percentage of the population reported two or more races, and 2) Hispanic or Latino origin statistics represent ethnicity (not race) and include all persons who identify themselves as of Hispanic or Latino origin or decent.

Sources: U.S. Census Bureau 2007g, 2007h

Table 3-5 Estimated Race and Ethnicity (2006)

Geographic Area	White		Black or African American		American Indian and Alaska Native		Asian, Native Hawaiian, and Other Pacific Islanders		Some Other Race		Hispanic or Latino (of any race)[1,2]	
	Number	%	Number	%	Number	%	Numbers	%	Number	%	Number	%
U.S.	221,331,507	73.9	37,051,483	12.4	2,369,431	0.8	13,526,289	4.5	25,119,775	8.4	44,252,278	14.8
New Jersey	6,073,160	69.6	1,187,161	13.6	17,494	0.2	656,740	7.5	790,005	9.1	1,364,699	15.6
Monmouth County	523,224	82.4	48,488	7.6	1,393	0.2	33,065	5.2	29,115	4.6	51,394	8.1

Notes: [1] The Hispanic population is not a racial category and includes components in each of the five racial categories (i.e. Hispanic figures cannot be added to racial categories to reach total population figure; double counting would result)
[2] Race statistics presented in this table will not add to 100 percent for two reasons: 1) a small percentage of the population reported two or more races, and 2) Hispanic or Latino origin statistics represent ethnicity (not race) and include all persons who identify themselves as of Hispanic or Latino origin or decent.

Source: U.S. Census Bureau 2007b

3.2.2.3 Place of Work

As mentioned in the introduction, the ROI is part of the greater New York metropolitan area. As shown in Table 3-6, a significantly higher percentage of New Jersey residents (including those in Monmouth County, Colts Neck, and Tinton Falls) worked outside the state of residence than the national average. Within the ROI, it is notable that Colts Neck had the lowest percentage of

residents who work within the state of residence (79.3 percent) and the highest percentage of residents who worked outside the state of residence (20.7 percent). Additionally, the segment of the Colts Neck population that lived on NWS Earle comprised 38 percent of those that lived in Colts Neck and worked in Monmouth County. Tinton Falls more closely mirrored the national than the state-wide place of work statistics, but has a higher rate of persons that work outside their county and state of residency than the national rate.

Table 3-6 Place of Work (2000)

Geographic Area		Worked in State of Residence		Worked in County of Residence		Worked Outside County of Residence		Worked Outside State of Residence	
	Total	Number	%	Number	%	Number	%	Number	%
U.S.	128,279,228	123,643,704	96.3	94,042,863	73.3	29,600,841	23.1	4,635,524	3.6
New Jersey	3,876,433	3,396,785	87.6	2,126,179	54.9	1,270,606	32.8	479,648	12.4
Monmouth County	291,938	257,805	88.3	175,070	59.9	82,735	28.3	34,133	11.7
Colts Neck Township	5,983	4,747	79.3	3,496	58.4	1,251	20.9	1,236	20.7
Tinton Falls Borough	7,852	7,252	92.4	5,197	66.2	2,055	26.2	600	7.6

Source: U.S. Census Bureau 2007i

3.2.2.4 Educational Attainment

As detailed in Table 3-7, there is a higher level of educational attainment within the ROI as compared to Monmouth County, New Jersey, and the U.S. Educational attainment is surveyed for the population that is 25 years or older. Among this segment of the population, there is a notably higher proportion of individuals that have obtained an associate's degree or higher in the ROI. Whereas approximately 50 percent of the 25 and older population in the ROI has attained this level of education, the attainment rates in Monmouth County, New Jersey, and the U.S. are lower (41, 35, and 31 percent, respectively). Within the ROI, the percentage of individuals having high school as the highest level of educational attainment, at 23 percent, was lower than that of Monmouth County (27 percent), New Jersey (29 percent) and the U.S. (29 percent).

Table 3-7 Level of Educational Attainment (2000)

Geographic Area	High School Graduates[1]		Associates Degree or Higher[2]		Population 25 Years or Older
	Number	%	Number	%	
U.S.	52,168,981	29	55,975,438	31	182,211,639
New Jersey	1,661,493	29	1,982,957	35	5,657,799
Monmouth County	113,343	27	169,235	41	413,058
Colts Neck Township	1,675	23	3,847	53	7,254
Tinton Falls Borough	2,377	23	5,157	49	10,457

Note: [1] Includes high school degree equivalency
[2] Includes Associate degree, Bachelor's degree, Master's degree, Professional school degree, and Doctorate degree
Source: U.S. Census Bureau 2007j

3.2.3 Employment and Income

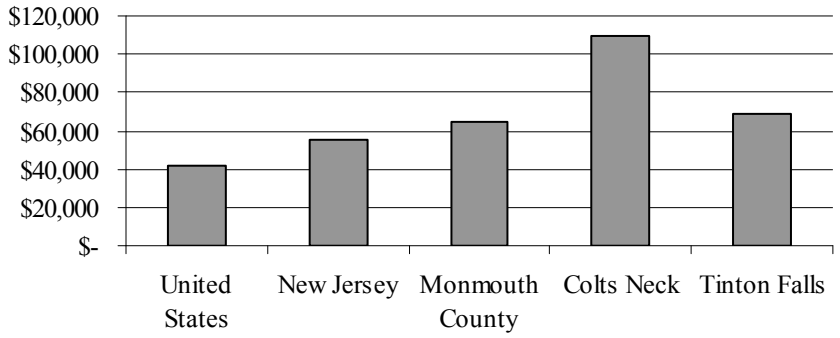
3.2.3.1 Labor Force and Income

As shown in Table 3-8, the ROI has a greater percentage of employed individuals and higher levels of income than Monmouth County, New Jersey, and the U.S. In 2000, Tinton Falls employment levels were at 72 percent and Colts Neck employment levels were at 69 percent while in the U.S. and New Jersey employment rates were at 64 percent. Although the median household and per capita income in 1999 are higher within the ROI than surrounding areas, income levels are particularly greater within Colts Neck.

Table 3-8 Labor Force and Income (1999)

Locality	In Labor Force (Pop. 16 years and over)		Median Household Income in 1999 ($s)	Per Capita Income in 1999 ($s)
	Number	%		
U.S.	138,820,935	64	41,994	21,587
New Jersey	4,204,393	64	55,146	27,006
Monmouth County	311,406	66	64,271	31,149
Colts Neck Township	6,240	69	109,190	46,795
Tinton Falls Borough	8,263	72	68,697	31,520

Graphical Representation of Median Household Income (1999)



Source: U.S. Census Bureau 2007c

While the median household income level for New Jersey as a whole is higher than that of the U.S., an evaluation of income distribution shown in Table 3-9 further distinguishes the ROI from the surrounding area. Far fewer households in the ROI earned less than $50,000 in 1999 as compared to New Jersey. The median household income bracket with the largest number of households for Colts Neck was $100,000 to $199,000 (29 percent), whereas the largest income bracket for Tinton Falls was $50,000 to $99,999 (39 percent). Colts Neck Township had a much higher number of households in the $200,000 or more median household income bracket (25 percent) than Tinton Falls or other areas.

Table 3-9 Income Distribution

Locality	Percent by Household Income Bracket				
	$0 to $29,999	**$30,000 to $49,999**	**$50,000 to $99,999**	**$100,000 to $199,999**	**$200,000 or more**
U.S.	35	23	29	10	2
New Jersey	26	19	33	17	4
Monmouth County	22	17	34	22	6
Colts Neck Township	11	14	22	29	25
Tinton Falls Borough	17	17	39	24	4

Source: U.S. Census Bureau 2007k

3.2.3.2 Income Below Poverty Level

As shown in Table 3-10, of individuals who reported an income within the ROI in 1999, only 2.8 percent were living below the poverty level for Colts Neck and 3.9 percent in Tinton Falls. In comparison, 12.4 percent of individuals were living below the poverty threshold for the U.S.

Table 3-10 Income Below the Poverty Level (1999)

Geographic Area	Income Below Poverty Level		Total Reported on Income
	Number	**%**	
U.S.	33,899,812	12.4	273,882,232
New Jersey	699,668	8.5	8,232,588
Monmouth County	38,242	6.3	605,698
Colts Neck Township	308	2.8	11,116
Tinton Falls Borough	577	3.9	14,844

Source: U.S. Census Bureau 2007l

3.2.3.3 Employment by Industry

Of the population that is 16 years and older within the ROI, the top employment industries are educational, health, and social services, at approximately 19 percent for both Colts Neck and Tinton Falls. Professional, scientific, management, administrative, and waste management services is the second top employment industry for Colts Neck (15.1 percent), whereas, retail trade is second for Tinton Falls (11.8 percent) followed closely by the professional industry (11.5 percent). In comparison to the U.S., the ROI has a greater percentage of individuals 16 years and older employed in the finance, insurance, real estate, rental, and leasing and the professional, scientific, management, administrative, and waste management services industries. The U.S., New Jersey, Monmouth County, Colts Neck Township, and Tinton Falls Borough all have approximately the same percentage of their respective populations within the educational, health and social services industry. Table 3-11 presents employment by industry data for the population 16 years and older.

Table 3-11 Employment by Industry (2000)

Employment Industry	U.S.		New Jersey		Monmouth County		Colts Neck Township		Tinton Falls Borough	
	Number	%	Number	%	Number	%	Number	%	Number	%
Agriculture, forestry, fishing and hunting, and mining	2,426,053	1.9	12,618	0.3	1,104	0.4	52	1.2	22	0.3
Construction	8,801,507	6.8	220,817	5.6	19,046	6.5	250	5.5	316	4.1
Manufacturing	18,286,005	14.1	472,684	12.0	24,325	8.3	318	7.0	725	9.4
Wholesale Trade	4,666,757	3.6	173,166	4.4	11,102	3.8	173	3.8	334	4.3
Retail Trade	15,221,716	11.7	447,346	11.3	35,372	12.0	545	12.1	914	11.8
Transportation and warehousing, and utilities	6,740,102	5.2	234,801	5.9	15,835	5.4	158	3.5	389	5.0
Information	3,996,564	3.1	173,865	4.4	15,320	5.2	178	3.9	591	7.6
Finance, insurance, real estate and rental and leasing	8,394,972	6.9	352,722	8.9	32,448	11.0	673	14.9	799	10.3
Professional, scientific, management, administrative, and waste management services	12,061,865	9.3	453,842	11.5	35,865	12.2	684	15.1	892	11.5
Educational, health and social services	25,843,029	19.9	783,137	19.8	57,326	19.5	861	19.0	1,502	19.4
Arts, entertainment, recreation, accommodation and food services	10,210,295	7.9	271,864	6.9	18,865	6.4	242	5.4	372	4.8
Other Services	6,320,632	4.9	173,686	4.4	12,113	4.1	181	4.0	378	4.9
Public Administration	6,212,015	4.8	179,481	4.5	15,901	5.4	209	4.6	532	6.7
Total	**129,721,512**		**3,950,029**		**294,622**		**4,524**		**7,757**	

Source: U.S. Census Bureau 2007m

3.2.4 Housing

3.2.4.1 Housing Units and Occupancy

As shown in Table 3-12, Colts Neck had the highest housing occupancy rate within the ROI (at 97 percent), which was slightly higher than Tinton Falls (95 percent). Colts Neck and Tinton Falls Borough had similar owner occupied housing rates (82 and 83 percent, respectively); while the owner occupied housing rate for the U.S. and the state of New Jersey were much lower (66 percent). The vacancy rate for Tinton Falls Borough was 5 percent, which was higher than Colts Neck Township, at 3 percent; however, in comparison, the vacancy rate for the U.S. was 9 percent. Based on census tract level data, approximately 76 percent of the occupied rental housing units within Colts Neck were NWS Earle housing units (U.S. Census Bureau 2007s).

Table 3-12 Occupied Housing Units (2000)

Geographic Area	Owner Occupied Housing Units		Renter Occupied Housing Units		Vacant Housing Units		Total Housing Units	
	Number	%	Number	%	Number	%	Number	% Occupied
U.S.	69,815,753	66	35,664,348	34	10,424,540	9	115,904,641	91
New Jersey	2,011,473	66	1,053,172	34	245,630	7	3,310,275	93
Monmouth County	167,311	75	56,925	25	16,648	7	240,884	93
Colts Neck Township	2,885	82	628	18	101	3	3,614	97
Tinton Falls Borough	4,873	83	1,010	17	328	5	6,211	95

Source: U.S. Census Bureau 2007c

As shown in Table 3-13, in 2000, Colts Neck had 3,026 detached single family housing units, comprising 83.7 percent of the total units. In Tinton Falls, there were 3,417 detached single family housing units comprising 54.9 percent of the total units, which is a lower share than the U.S. (at 60.3 percent). Colts Neck Township has no structures with more than 9 units. Tinton Falls Borough has a small percentage of structures with 10 to 19, 20 to 49, and 50 and more units (3.9, 0.6, and 2.9 percent, respectively).

As shown in Table 3-14, Census 2000 data show Colts Neck Township had a much higher percentage of owner occupied housing units with 5 bedrooms or more (20.9 percent) than the U.S. (2.9 percent), New Jersey (4.5 percent), Monmouth County (7.6 percent), and Tinton Falls Borough (2.1 percent). Within Colts Neck, the greatest percentage of owner occupied homes had four bedrooms (38.4 percent); while, in Tinton Falls two bedrooms were the most common (26.5 percent), followed closely by three bedrooms (26.2 percent). In comparison, the highest percentage of owner occupied homes in the U.S., New Jersey, and Monmouth County had three bedrooms (33.0, 27.9, and 26.9 percent, respectively).

Table 3-13 Units in Structure (2000)

Units in Structure	U.S.		New Jersey		Monmouth County		Colts Neck Township		Tinton Falls Borough	
	Number	%	Number	%	Number	%	Number	%	Number	%
1, detached	69,865,957	60.3	1,794,967	54.2	161,048	66.9	3,026	83.7	3,417	54.9
1, attached	6,447,453	5.6	285,268	8.6	19,766	8.27	310	8.6	1,401	22.5
2	4,995,350	4.3	331,393	10.0	9,684	4.07	41	1.1	77	1.2
3 or 4	5,494,280	4.7	223,580	6.8	9,347	3.9	174	4.8	231	3.7
5 to 9	5,414,988	4.7	160,249	4.8	9,520	3.9	56	1.6	636	10.2
10 to 19	4,636,717	4.0	161,666	4.9	10,510	4.4	0	0.0	240	3.9
20 to 49	3,873,383	3.3	121,452	3.7	6,112	2.5	0	0.0	34	0.6
50 or more	6,134,675	5.3	197,313	5.9	11,602	4.8	0	0.0	185	2.9
Total	**115,904,641**		**3,310,275**		**240,884**		**3,614**		**6,221**	

Source: U.S. Census Bureau 2007n

Table 3-14 Number of Bedrooms Per Unit (2000)

Number of Bedrooms	U.S.		New Jersey		Monmouth County		Colts Neck Township		Tinton Falls Borough	
	Number	%	Number	%	Number	%	Number	%	Number	%
OWNER OCCUPIED	69,816,513	66.2	2,011,298	65.6	167,273	74.6	2,896	82.4	4,878	82.9
No bedroom	435,488	0.4	5,582	0.2	264	0.1	0	0.0	0	0.0
1 bedroom	2,612,068	2.5	76,397	2.5	5,213	2.3	20	0.6	180	3.1
2 bedrooms	14,921,873	14.2	408,851	13.3	30,213	13.5	160	4.6	1,562	26.5
3 bedrooms	34,823,934	33.0	854,166	27.9	60,485	26.9	631	17.9	1,542	26.2
4 bedrooms	13,934,814	13.2	527,104	17.2	54,138	24.1	1,348	38.4	1,472	25.0
5 or more bedrooms	3,088,336	2.9	139,198	4.5	16,960	7.6	737	20.9	122	2.1
RENTER OCCUPIED	35,663,588	33.8	1,053,347	34.4	56,963	25.4	617	17.6	1,010	17.2
No bedroom	2,581,973	2.5	66,123	2.2	3,800	1.7	0	0.0	6	0.1
1 bedroom	10,994,851	10.4	411,093	13.4	24,441	10.9	54	1.5	271	4.6
2 bedrooms	13,716,204	13.0	373,620	12.2	17,934	8.0	352	10.0	354	6.0
3 bedrooms	6,721,506	6.4	161,774	5.3	7,884	3.5	151	4.3	329	5.6
4 bedrooms	1,358,808	1.3	31,873	1.0	2,277	1.0	50	1.4	45	0.8
5 or more bedrooms	290,246	0.3	8,864	0.3	627	0.3	10	0.3	5	0.1
Total	**105,480,101**		**3,064,645**		**224,236**		**3,513**		**5,888**	

Source: U.S. Census Bureau 2007t. Summary File 3, Tenure by Bedrooms. Table H42.

3.2.4.2 Housing Costs

Housing costs in the ROI are in excess of costs for Monmouth County, New Jersey, and the U.S. Median gross rent for renter occupied housing units in 2000 in Colts Neck was $974 and in Tinton Falls was $1,198 (U.S. Census Bureau 2007o). By comparison, this statistic for

Monmouth County and New Jersey is considerably lower ($751 for New Jersey and $759 for Monmouth County) and the U.S. average is lower still ($602) (U.S. Census Bureau 2007o). The median value for owner-occupied housing units in Colts Neck in 2000, at $429,400 was more than twice that of other areas evaluated (U.S. Census Bureau 2007r). The same statistic for Tinton Falls was $172,500, which is closer to Monmouth County ($195,800) and New Jersey ($167,900) (U.S. Census Bureau 2007r). By comparison, the nationwide average was $111,800 (U.S. Census Bureau 2007r). In 2007, the average residential sales price was $926,244 in Colts Neck and $367,215 in Tinton Falls as compared with $490,237 in Monmouth County (State of New Jersey 2007a).

Table 3-15 provides the average 2008 housing costs in the NWS Earle vicinity as estimated by the Commander, Navy Installations Command (CNIC).

Table 3-15 Average Community Housing Costs (2008 Dollars)

Monthly Rent	1-bedroom	2- bedroom	3- bedroom	4- bedroom	5- bedroom
Apartment	1,200	1,500	1,800	N/A	N/A
Condominium	1,500	1,800	2,300	N/A	N/A
Townhouse	1,500	2,000	2,300	N/A	N/A
House	N/A	2,100	2,400	2,600	3,000
Purchase					
Condominium	N/A	245,000	300,000	N/A	N/A
Townhouse	N/A	245,000	300,000	N/A	N/A
House	N/A	275,000	315,000	350,000	400,000

Source: CNIC 2008
Note: N/A = not available

3.2.4.3 Housing Construction Trends

As shown in Table 3-16, most housing units in Tinton Falls were built in the 1980s (31 percent) and most housing units in Colts Neck were built in the 1960s (24 percent). By comparison, throughout Monmouth County, New Jersey, and the U.S., the decade in which housing units were built is more evenly dispersed.

From 2000 to 2006, 220 building permits were issued for 221 units in Colts Neck and 539 permits were issued for 1,139 units in Tinton Falls (U.S. Census Bureau 2007p). All construction permits issued in Colts Neck were for single family homes. In comparison, 14,852 permits were issued for 18,266 units in Monmouth County (U.S. Census Bureau 2007p). Since 2000, there has been a downward trend in Colts Neck, from 58 to 11 permits issued (a 427 percent decline) (U.S. Census Bureau 2007p). However, in Tinton Falls, permits and number of units built has fluctuated since 2000 with a peak in 2002, when 152 permits were issued for 152 single family homes (U.S. Census Bureau 2007p).

Table 3-16 Year Structure Built (2000)

Year Structure Built	U.S.		New Jersey		Monmouth County		Colts Neck Township		Tinton Falls Borough	
	Number	%	Number	%	Number	%	Number	%	Number	%
Built 1999 to March 2000	2,755,075	2	48,124	2	4,080	2	107	3	243	4
Built 1995 to 1998	8,478,975	7	139,421	4	13,312	6	401	11	742	12
Built 1990 to 1994	8,467,008	7	158,581	5	15,108	6	362	10	954	15
Built 1980 to 1989	18,326,847	16	409,978	12	38,325	16	673	19	1,912	31
Built 1970 to 1979	21,438,863	19	462,740	14	35,833	15	602	17	250	4
Built 1960 to 1969	15,911,903	14	526,732	16	40,748	17	891	25	654	11
Built 1950 to 1959	14,710,149	13	565,847	17	36,509	16	228	6	1,030	17
Built 1940 to 1949	8,435,768	7	332,806	10	17,209	7	92	3	267	4
Built 1939 or earlier	17,380,053	15	666,046	20	39,760	17	258	7	169	3
Total	**115,904,641**		**3,310,275**		**240,884**		**3,614**		**6,221**	

Source: U.S. Census Bureau 2007q

3.2.5 NWS Earle Economic Impact

Total annual procurement in 2007 associated with NWS Earle totaled $556 million; total annual payroll in 2007 totaled $69 million, which included pay for active duty military, retirees, and civil service personnel (Commander Navy Region Mid-Atlantic 2008).

As noted in Table 1-1, the workforce at NWS Earle is 1,473 persons. The majority of the workforce is associated with the tenant/ships. Civilians comprise approximately 55 percent of the workforce. Military personnel total 403 people or approximately 27 percent of the total workforce, and contractors comprise 18 percent of the workforce.

The total of all contracts exceeding $25,000 at NWS Earle in Fiscal Year 2006 was $6,995,407 (Department of Defense [DoD] 2007). To place this in context, personal income in 2005 in Monmouth County totaled $30.8 billion (U.S. Bureau of Economic Analysis 2007a). (Data for 2006 is not yet available at the county level.) By comparison, all DoD contracts exceeding $25,000 in New Jersey in Fiscal Year 2006 was in excess of $6 billion (DoD 2007) and total personal income in 2006 in New Jersey was $404.2 billion (U.S. Bureau of Economic Analysis 2007b).

3.2.6 Taxes

State and local tax collections in New Jersey include property taxes, sales and gross receipt taxes, license taxes, income taxes, and other taxes (death and gift taxes, documentary and staff transfers). The focus of the analysis for this EIS is on state and local property taxes.

3.2.6.1 Overview of New Jersey Property Tax Structure

New Jersey localities collected $19.2 billion in property taxes in fiscal year 2005 (local government fiscal year 1 July 2004 to 30 June 2005) (U.S. Census Bureau 2007v). At the state

level, New Jersey collected $3.5 million in property taxes during fiscal year 2005 (U.S. Census Bureau 2007v). New Jersey's combined (state and local government) per capita property tax collections in fiscal year 2005 were the highest in the nation at $2,202 (U.S. Census Bureau 2005 and U.S. Census Bureau 2007v).

New Jersey's real property tax is an "ad valorem tax," meaning a tax according to value. All real property is assessed according to the same standard of value except for qualified agricultural or horticultural land. The standard measure of property value is "true value" or market value. The value of qualified farmland is based upon its productive capabilities when devoted to agricultural or horticultural uses. New Jersey's equalization program is designed to ensure that each taxing district, as a whole, is treated equitably. Equalized valuations are used to apportion among taxing districts within a county the costs of county government; as a component of the formula used for the distribution of school aid; and for the distribution of costs of school districts covering more than one municipality. The principal part of the work of equalization lies in determining the aggregate true value of all real estate in each of the state's 566 taxing districts. This figure is established by a program of assessment-sales ratio analysis. County, municipal, and school budget costs determine the amount of property tax to be paid. A town's general tax rate is calculated by dividing the total dollar amount it needs to raise to meet local budget expenses by the total assessed value of all its taxable property. An individual's property taxes are then calculated by multiplying that general tax rate by the assessed value of the particular property. Because of New Jersey's strong "home rule" concept of government, the State does not participate in the making of local budgets, nor does it receive any of the local property taxes collected (State of New Jersey 2007b).

On average, 55 percent of municipal property taxes in New Jersey are school taxes. More than 50 percent of the per pupil education costs are supported by this municipal funding, the remainder is mostly supported by state funding, with less than 5 percent supported by federal funding (New Jersey Joint Legislative Committee on Public School Funding Reform 2006).

3.2.6.2 School Funding

Per Article VIII, Section IV, Paragraph 1 of the New Jersey Constitution "The Legislature shall provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all the children in the State between the ages of five and eighteen years." Chapter 212 of the Public School Education Act of 1975 (N.J.S.A. 18A:7A-1) established a guaranteed tax base formula, the Quality Education Act of 1990 (N.J.S.A. 18A:7D-1) established a foundation formula system, and the Comprehensive Education Improvement and Financing Act (CEIFA) of 1996 (N.J.S.A. 18A:7F-1) included a uniform per-pupil regular education spending amount based on a set of assumptions regarding the inputs needed to provide a thorough education in an efficient manner (New Jersey Joint Legislative Committee on Public School Funding Reform 2006). In its decision in Abbott v. Burke, 149 N.J. 145, 693 A.2d 417 (1997) ("Abbott IV"), the New Jersey State Supreme Court found that the funding provisions of CEIFA were unconstitutional as applied to the Abbott districts (special needs districts). The Court required an interim remedy that dictated that Abbott districts would receive "parity aid," or

an amount equal to the average regular education per pupil expenditures in the State's wealthiest districts. In Abbott v. Burke, 153 N.J. 480, 710 A.2d 450 (1998) ("Abbott V"), the Court held that Abbott districts could also seek supplemental funding over parity to support particularized needs (NJDOE 2007).

The CEIFA formula was calculated from fiscal year 1998 through fiscal year 2002. Since that year, the formula has not been run and State aid has been distributed based on district demographics and other characteristics existing in fiscal year 2002. During that time period, litigation over various aspects of funding for the Abbott districts continued, and in May 2006, the New Jersey Department of Education (NJDOE) informed the Court that the creation of a new funding formula was a priority. Since 2002, the last year in which CEIFA was calculated, many districts have experienced significant demographic shifts that have not been accounted for or reflected in the distribution of state aid. Increases in aid have been highly unpredictable, which has hindered all school districts in planning and budgeting for each upcoming school year (NJDOE 2007).

The NJDOE proposed a new school funding formula in December 2007, the "School Funding Reform Act of 2008." If passed by the New Jersey State Legislature, the new formula would be used beginning in fiscal year 2009 (NJDOE 2007).

3.2.6.3 ROI Tax Rates

The general tax rate, used in determining the amount of tax levied upon each property, is expressed as $1 per $100 of taxable assessed value. For example, if the assessed value of a property is $100,000 and the general tax rate is 3.025, the tax bill would be $3,025. The effective tax rate is based on a statistical study that enables the comparison of one district to another district (based on the assumption that all districts are at 100 percent valuation). For Colts Neck, in 2006, the general tax rate was 3.070 and the effective tax rate was 1.429. For Tinton Falls, the general tax rate was 3.590 and the effective tax rate was 1.780 (State of New Jersey 2007c). The average residential property taxes in 2003 were $9,549 in Colts Neck and $4,587 in Tinton Falls as compared to a statewide average of $5,269 (Shure and Forsberg 2005).

3.2.6.4 Taxation at Laurelwood Housing Area

Naval Weapons Station Earle is federal property and, therefore, no tax is levied on the realty owned by the federal government. However, the leasehold interest of the developer is eligible for taxation pursuant to 10 U.S.C. § 2667, which states that "The interest of a lessee of property leased under this section may be taxed by State or local governments." In addition, federal ownership of the realty does not preclude taxation of the improvements owned by the developer. The determination of whether (and how) the developer's leasehold interest and/or improvements are taxed rests entirely with state and local taxing authorities.

3.3 COMMUNITY SERVICES AND FACILITIES

Community services and facilities evaluated herein include education (schools and child services), police, fire and medical services, and recreation. The focus is on those facilities and services serving residents of the Laurelwood housing area as well as those that may be impacted by future residents of the housing area. This includes NWS Earle facilities and services as well as those in the surrounding community.

3.3.1 Education

3.3.1.1 Youth and Child Development Centers

There is a Child Development Center at NWS Earle located at Building C-60 on Saipan Road south of the Stark Road housing area (Figure 2-1). The Child Development Center serves military dependents ages 6 weeks to pre-kindergarten (pre-K). There is a Youth Activities Center at NWS Earle located in Building C-62 on Macassar Road in the southeast corner of the Stark Road housing area. The Youth Activities facility offers a variety of activities for children of military dependents in kindergarten through 16 years of age, including before and after school programs.

3.3.1.2 School Infrastructure and Capacity

As noted in Section 1.3.3, current New Jersey law requires that all children residing at mainside NWS Earle be educated in the Tinton Falls School District, which includes Mahala F. Atchison Elementary School (pre-K through Grade 3), Swimming River Elementary School (Grades 4 and 5), and Tinton Falls Middle School (Grades 6 through 8). Monmouth Regional School District educates these children after Grade 8. Tinton Falls School District students attend Monmouth Regional High School, the only school in the Monmouth Regional School District. High school students may also attend Monmouth County Vocational School District, a county-wide program providing a variety of 4-year diploma granting career academies in which the curriculum focuses on career and occupational themes, including: Academy of Allied Health and Science, Biotechnology High School, 'Chance to Learn and Achieve While Striving for Success' [CLASS] Academy (emphasis use of technology and computers), Communications High School, High Technology High School, KIVA High School (special needs), Marine Academy of Science & Technology, Monmouth County Career Center (vocational), and Monmouth County Vocational Technical High School (NJDOE 2006a).

Private schools in the Tinton Falls/Colts Neck area include:

- Collingwood Park Seventh Day Adventist School (Grades 1-8) (NJDOE 2008).
- Winding Brook School (Elementary) (NJDOE 2008).
- Dorothy B. Hersh High School (for developmentally disabled, ages 14-21) (Arc of Monmouth 2008).

- Oakwood School (a non-profit, non-sectarian school for the disabled, Grades 6-12) (Oakwood School 2008).
- Raney School (pre-K to Grade 12) (NJDOE 2008).
- Goddard School of Tinton Falls (Kindergarten) (NJDOE 2008).
- Kinder College (Kindergarten) (NJDOE 2008).
- Christian Brothers Academy (High School) (Anfuso 2009).
- Red Bank Catholic High School (Anfuso 2009).
- St. John Vianney High School (Anfuso 2009).

Enrollment

Table 3-17 presents the enrollment statistics for Tinton Falls schools and Monmouth Regional High School from the 2002-2003 to 2007-2008 school years (includes students "on roll" by grade in October of each school year). During this time period, enrollment at Mahala F. Atchison Elementary School has remained relatively constant. Some of the fluctuation in enrollment at Swimming River Elementary School and Tinton Falls Middle School is due to the shifting of Grade 6 from Swimming River Elementary school to Tinton Falls Middle school in the 2004-2005 school year. Combined enrollment in these two schools was relatively constant between 2002 and 2004 (1,007; 1,003; and 1,025) but decreased by 14 percent between 2004 and 2005 and remained steady through 2007. Enrollment at Monmouth Regional High School has increased slightly each year through 2006, falling off slightly in 2007.

Average Class Size

The NJDOE has established recommended class sizes for grades Kindergarten through 12. These recommendations are 15 students for pre-K; 21 students for Kindergarten through Grade 3; 23 students for Grades 4 through 8; and 24 students for Grades 9 through 12 (NJDOE 2006b). Table 3-18 compares average class size by grade for schools in the ROI against these NJDOE recommended class sizes and the statewide average class sizes. The average class size at Mahala F. Atchison exceeds the state averages for all grades except Pre-K and Kindergarten and special education. Average class sizes at Swimming River Elementary School exceed state averages for all grades except special education. Tinton Falls Middle School has considerably lower class sizes than the state average. Monmouth Regional High School class sizes are all lower than the state average.

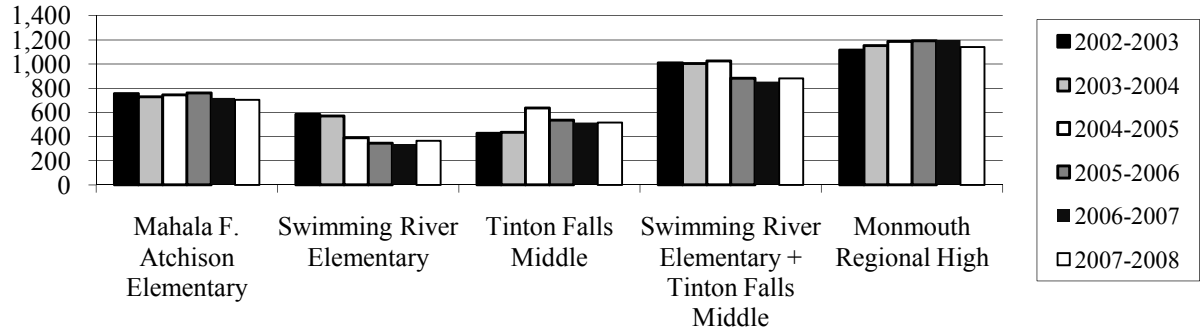
Average class sizes at Mahala F. Atchison for Grades 2 and 3 exceed the NJDOE class size recommendation. Swimming River Elementary School class sizes remain slightly below NJDOE recommended class sizes. Tinton Falls Middle School class sizes are much lower than the

NJDOE recommended class sizes. All class sizes at Monmouth Regional High School are below the NJDOE recommended class sizes.

Table 3-17 School Enrollment (2002-2003 through 2007-2008)

School/Grade	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Mahala F. Atchison Elementary School						
Pre-K (half-day)	N/A	N/A	N/A	1.0	N/A	N/A
Kindergarten (half-day)	158.0	150.0	130.0	154.0	140.0	121.0
Grade 1	181.0	185.0	189.0	168.0	175.0	167.7
Grade 2	173.0	179.0	198.0	199.0	166.0	184.0
Grade 3	209.0	173.0	180.0	191.0	182.0	154.0
Special Ed. (ungraded)	32.0	41.0	46.0	47.0	57.0	68.0
Total School	**753.0**	**728.0**	**743.0**	**760.0**	**720.0**	**703.0**
Swimming River Elementary School						
Grade 4	177.0	198.0	190.0	157.0	167.0	180.0
Grade 5	173.0	176.0	186.0	180.0	155.0	178.0
Grade 6	209.0	181.0	N/A	N/A	N/A	N/A
Special Ed. (ungraded)	22.0	14.0	13.0	8.0	18.0	7.0
Total School	**581.0**	**569.0**	**389.0**	**345.0**	**340.0**	**365.0**
Tinton Falls Middle School						
Grade 6	N/A	N/A	193.0	190.0	167.0	159.0
Grade 7	219.0	209.0	197.0	158.0	187.0	161.0
Grade 8	199.0	214.0	230.0	175.0	151.0	189.0
Special Ed. (ungraded)	8.0	11.0	16.0	12.0	11.0	6.0
Total School	**426.0**	**434.0**	**636.0**	**535.0**	**516.0**	**515.0**
Monmouth Regional High School						
Grade 9	327.0	295.0	315.5	288.5	260.0	248.0
Grade 10	269.0	258.0	323.5	305.5	276.0	270.5
Grade 11	240.0	227.0	262.0	280.5	279.0	269.0
Grade 12	241.0	222.0	229.5	255.5	279.0	276.5
Special Ed. (ungraded)	36.0	148.0	54.5	60.5	105.5	77.0
Total School	**1,113**	**1,150**	**1,185**	**1,191**	**1,200**	**1,141**

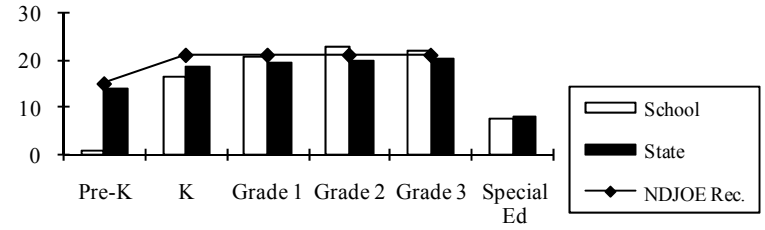
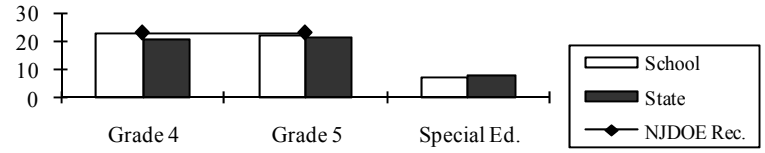
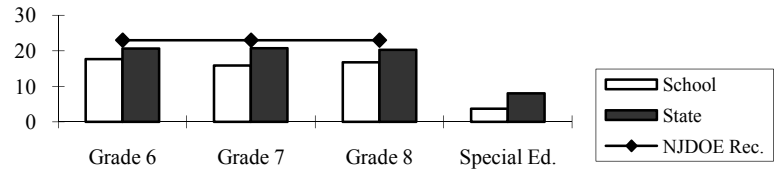
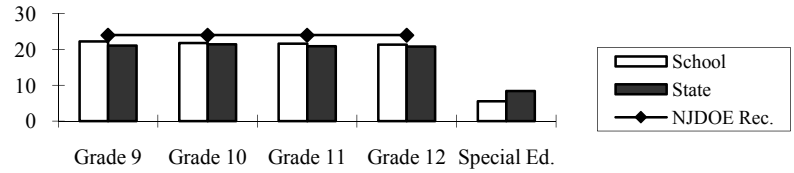
Graphical Representation – School Enrollment



Source: NJDOE 2006a, 2009

Notes: N/A – Data not reported by the NJDOE.

Table 3-18 Average Class Size for Schools (2007-2008)

School/Grade	Average Class Size		Graphical Representations
	School	State	
Mahala F. Atchison Elementary School			
Pre-K*	1.0	13.9	
Kindergarten	16.3	18.6	
Grade 1	20.9	19.4	
Grade 2	23.0	19.7	
Grade 3	22.0	20.1	
Special Ed. (ungraded)	7.6	8.0	
Total School	17.6	18.9	
Swimming River Elementary School			
Grade 4	22.5	20.4	
Grade 5	22.3	21.1	
Special Ed. (ungraded)	7.0	8.0	
Total School	21.5	18.9	
Tinton Falls Middle School			
Grade 6	14.5	20.7	
Grade 7	13.4	20.4	
Grade 8	17.2	20.4	
Special Ed. (ungraded)	6.0	8.0	
Total School	14.7	18.9	
Monmouth Regional High School			
Grade 9	17.7	20.6	
Grade 10	15.9	20.7	
Grade 11	16.8	20.3	
Grade 12	18.4	20.6	
Special Ed. (ungraded)	3.7	8.0	
Total School	13.7	18.9	

NJDOE Recommended Class Sizes:
- Pre-K: 15 students
- Kindergarten through Grade 3: 21 students
- Grades 4 through 8: 23 students
- Grades 9 through 12: 24 students

*Data for Pre-K not available for 2007-2008. Data presented is for 2005-2006.

Source: NJDOE 2006a, 2006b, 2009

Student/Faculty Ratio

Table 3-19 presents the data on student/faculty ratio for schools in the ROI for the 2003-2004, 2004-2005, 2005-2006, 2006-2007, and 2007-2008 school years and the corresponding state-wide ratios. Mahala F. Atchison Elementary School has exceeded the state average for all years, even in the 2007-2008 school year when the overall enrollment was slightly lower (Table 3-17). The student/faculty ratio for Tinton Falls Middle School was higher than the state average in

2004-2005, but decreased below the state average for later school years. The student/faculty ratio at all other schools has been below the state-wide average.

Table 3-19 Student/Faculty Ratio (number of students per faculty member)

	School	State
Mahala F. Atchison Elementary School		
2003-2004	13.5	12.0
2004-2005	14.4	11.3
2005-2006	14.5	11.1
2006-2007	12.6	10.9
2007-2008	11.1	10.7
Swimming River Elementary School		
2003-2004	11.7	12.0
2004-2005	9.8	11.3
2005-2006	9.5	11.1
2006-2007	8.6	10.9
2007-2008	8.4	10.7
Tinton Falls Middle School		
2003-2004	10.9	12.0
2004-2005	13.8	11.3
2005-2006	10.2	11.1
2006-2007	9.2	10.9
2007-2008	8.6	10.7
Monmouth Regional High School		
2003-2004	9.2	11.6
2004-2005	9.2	11.4
2005-2006	9.0	11.4
2006-2007	9.1	11.3
2007-2008	8.7	11.1

Source: NJDOE 2006a, 2009

Capacity and Long-Range Facilities Plan

The physical capacities of Tinton Falls School District schools, according to the 2005 State Facilities Report, are as follows:

- Mahala F. Atchison Elementary School: 575 students,
- Swimming River Elementary School: 415 students,
- Tinton Falls Middle School: 598 students (Sydney-Gens 2008).

The enrollment at Mahala F. Atchison Elementary School, which was 703 for the 2007-2008 school year, (Table 3-17) exceeds the physical capacity by 22 percent. This capacity is also affected by special education students and programs that require certain larger classrooms for small groups of self-contained children. To address overcrowding issues, Tinton Falls School District has approached the Monmouth County Superintendent of Education for a waiver for dual use of space based on limited structure. Additionally, the district is currently reviewing and considering moving students, classes, and/or a single grade to Swimming River Elementary School (Sydney-Gens 2008).

The enrollment at Swimming River Elementary School, which was 365 for the 2007-2008 school year (Table 3-17), is 12 percent less than physical capacity. However, as is true at Mahala F. Atchison Elementary, this capacity is affected by the requirements of the increasing self-contained special education population (Sydney-Gens 2008).

The enrollment at Tinton Falls Middle School, which was 515 students for the 2007-2008 school year (Table 3-17), is 14 percent less than physical capacity. However, capacity has been exceeded due to the scheduling of departmentalized classes at each grade along with contractual obligations. Since 2006, Tinton Falls School District has had an approved waiver on file at the Monmouth County Superintendent of Education for dual use of space in one classroom (Sydney-Gens 2008).

A five-classroom addition was completed at Tinton Falls Middle School in 2004 and Grade 6 was assigned to Tinton Falls Middle School instead of Swimming River Elementary. Tinton Falls School District is currently contemplating a referendum specifically for repairs and renovations of the aging mechanical systems, bathrooms, roofs, and roadways (Sydney-Gens 2007).

The capacity of Monmouth Regional High School is 1,500 students (Parry 2007). This is 31 percent above the enrollment level, which was 1,141 for the 2007-2008 school year (Table 3-17). All the items on the Long-Range Facility Plan for Monmouth Regional High School have been addressed through a $7-million project for renovations and additions, funded through a referendum and completed in 2006 (Monmouth Regional High School 2007).

Per Pupil Expenditures

Table 3-20 presents the per pupil spending for schools within the ROI. The data represents spending per pupil in two ways: the comparative and total cost per pupil. The comparative cost per pupil represents comparisons with districts of similar budget type. The components that comprise the comparative cost per pupil are as follows: classroom instructional costs; support services (attendance and social work, health services, guidance office, child study team, library and other educational media); administrative costs (general administration, school administration, business administration, and improvement of instruction); operations/maintenance of plant; food services, and extracurricular costs. The total of these expenditures is divided by the average daily enrollment to calculate a total comparative cost per pupil.

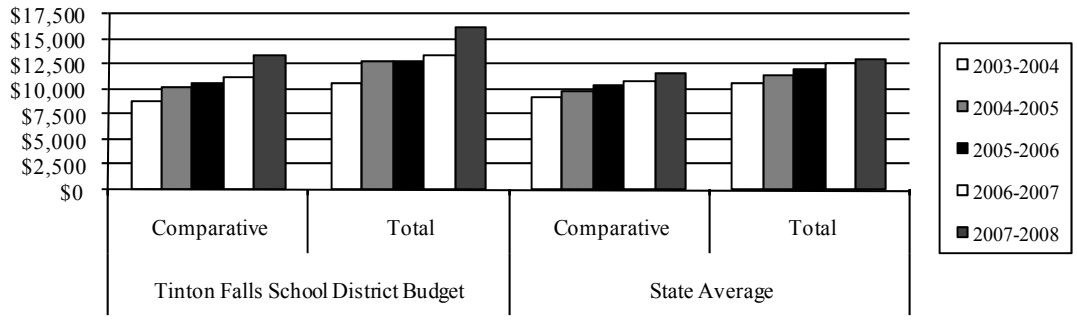
The total cost per pupil, in addition to all of the costs listed above for the comparative cost, includes costs for tuition expenditures; transportation; other current expenses (lease purchase interest, residential costs, and judgments against schools); equipment; facilities/acquisition; and restricted expenses less non-public services and adult schools, as well as students sent out of district. The total of all these expenditures is divided by the average daily enrollment to calculate a total cost per pupil (NJDOE 2006a).

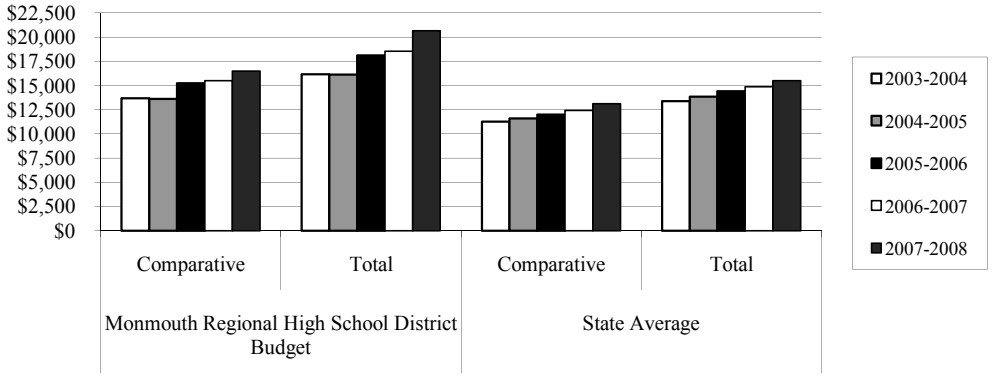
The total comparative and total cost per pupil in Tinton Falls School District was slightly below the state average in the 2003-2004 school year, but was above the state average in following school years. Per pupil spending in Monmouth County Regional School District is consistently higher than the state average. There has been an increase in per pupil spending over each of the last five school years in the Tinton Falls School District and the last five years in the Monmouth Regional School District.

Table 3-20 Per Pupil Expenditures (2003-2004 through 2007-2008)

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Tinton Falls School District Budget					
Total Comparative Cost Per Pupil	$8,791	$10,043	$10,500	$11,109	$13,401
Total Cost Per Pupil	$10,616	$12,635	$12,761	$13,277	$16,108
State Average (Elementary and Middle Schools)					
Total Comparative Cost Per Pupil	$9,203	$9,738	$10,276	$10,809	$11,521
Total Cost Per Pupil	$11,641	$11,238	$11,851	$12,489	$13,020
Monmouth Regional High School District Budget					
Total Comparative Cost Per Pupil	$13,681	$13,622	$15,247	$15,483	$16,490
Total Cost Per Pupil	$16,151	$16,123	$18,103	$18,530	$20,652
State Average (High Schools)					
Total Comparative Cost Per Pupil	$11,259	$11,603	$12,006	$12,432	$13,106
Total Cost Per Pupil	$13,396	$13,829	$14,414	$14,852	$15,489

Graphical Representation





Source: NJDOE 2006a, 2009.

Graduation Rate

The graduation rate for Monmouth Regional High School was 97.5 percent for the Class of 2004, 98.1 percent for the Class of 2005, 98.6 percent for the Class of 2006, 96.0 percent for the Class of 2007, and 98.0 percent for the class of 2008. These rates are notably higher than the state-wide graduation rates: 89.5 percent for the Class of 2004; 90.6 percent for the Class of 2005, 92.4 percent for the Class of 2006, 92.3 for the Class of 2007 and 92.8 for the Class of 2008 (NJDOE 2006a, 2009).

3.3.1.3 Federal Impact Aid Program

The U.S. Department of Education administers the Federal Impact Aid program. This program, established in 1950, was designed to assist local school districts that have lost property tax revenue due to the presence of tax-exempt federal property, or that have experienced increased expenditures due to the enrollment of federally connected children. The Impact Aid law (now Title VIII of the Elementary and Secondary Education Act of 1996 [20 U.S.C. § 2701 et seq.]) provides assistance to local school districts with concentrations of children residing on Indian lands, military bases, low-rent housing properties, or other federal properties and, to a lesser extent, concentrations of children who have parents in the uniformed services or employed on eligible federal properties who do not live on federal property. The Impact Aid law refers to local school districts as local educational agencies (LEAs) (U.S. Department of Education 2004).

Most Impact Aid funds, except for the additional payments for children with disabilities and construction payments, are considered general aid to the recipient school districts; these districts may use the funds in whatever manner they choose in accordance with their local and State requirements. Most recipients use these funds for current expenditures, but recipients may use the funds for other purposes such as capital expenditures. Some Impact Aid funds must be used for specific purposes (e.g., payments for Children with Disabilities must be used for the extra costs of educating these children). Impact Aid Program components include the following.

- Payments for Federal Property (Section 8002; 20 U.S.C. § 7702) assist local school districts that have lost a portion of their local tax base because of federal ownership of property. To be eligible, a school district must demonstrate that the federal government has acquired, since 1938, real property with an assessed valuation of at least 10 percent of all real property in the district at the time of acquisition (U.S. Department of Education 2004).

- Basic Support Payments (Section 8003(b); 20 U.S.C. § 7703) help local school districts that educate federally connected children. These may be the children of members of the uniformed services, children who reside on Indian lands, children who reside on federal property or in federally subsidized low-rent housing, and children whose parents work on federal property. There are certain thresholds that LEAs must meet in order to qualify for section 8003 funding: a) the LEA must be serving federally connected children numbering at least 400 in average daily

attendance, or b) at least 3 percent of the total number of children in average daily attendance must be such children. LEAs that serve federally connected children with disabilities may receive an additional payment to assist with the excess costs of providing educational services to these children. School districts that enroll certain percentages of federally connected children and meet other statutory requirements are considered heavily impacted LEAs and receive increased formula payments under section 8003(b)(2) (U.S. Department of Education 2004 and 2006a).

- Children With Disabilities Payments (Section 8003(d); 20 U.S.C. § 7703) provide additional assistance to school districts that educate federally connected children who are eligible for services under the Individuals with Disabilities Education Act (20 U.S.C. § 1400 et seq.). These payments are in addition to Basic Support Payments and Individuals with Disabilities Education Act funds provided on behalf of these children. A school district that receives these funds must use them for the increased costs of educating federally connected children with disabilities (U.S. Department of Education 2004).

- Construction Grants (Section 8007; 20 U.S.C. § 7707) go to local school districts that educate high percentages of certain federally connected children–children living on Indian lands and children of members of the uniformed services. These grants help pay for the construction and repair of school buildings. Section 8007(a) provides formula grants to the local school districts based on the number of eligible federally connected children they educate. Section 8007(b) provides competitive grants for emergency repairs and modernization (U.S. Department of Education 2004).

Most of the U.S. Department of Education Impact Aid (nearly 92 percent) is 8003 funding, slightly more than 5 percent is 8002 funding, and the remainder is 8007 construction grants (U.S. Department of Education 2004).

Since different types of federally connected students have a different financial impact on the school district, each type of federal student is assigned a weight. A higher weight corresponds to a higher amount of impact aid for that student. Student weights are as follows:

- Student residing on Indian lands: 1.25

- Student living on federal property with parent on active duty in the uniformed services: 1.00

- Student living on federal property and parent works on federal property: 1.00

- Student not living on federal property with parent on active duty in the uniformed services: 0.20

- Student living in low-rent housing: 0.10

- Student not living on federal property whose parent works on federal property: 0.05
- Student living on federal property (parent not on active duty in the uniformed services or working on federal property): 0.05

(Source: 20 U.S.C. § 7703)

To receive basic support payments, a school district must conduct a student survey each year to identify the number and types of federal connected children it is enrolling. The school district then completes the impact aid application and submits it directly to the U.S. Department of Education each year (National Association of Federally Impacted Schools 2006).

Table 3-21 shows the U.S. Department of Education Impact Aid 8002 and 8003 funding levels from 2000 through 2005, which is the most recent year data is available for these appropriations. In 2005, the U.S. Department of Education had $1,224,983,552 in Federal Impact Aid available for award under Section 8003. An estimated 1,400 awards were made at an average of $804,000 per award. The awards ranged from $200 to $35 million (U.S. Department of Education 2006b). Under Section 8002, the amount available for awards in 2005 was $62,496,000. An estimated 250 awards were made with an average award of $250,000 and a range of awards of $100 to $4 million (U.S. Department of Education 2006c).

Table 3-21 U.S. Department of Education Impact Aid 8002 and 8003 Funding Levels (2000-2005)

	8003 Appropriation	8002 Appropriation
2000	$859,400,000	$32,000,000
2001	$932,000,000	$40,500,000
2002	$1,032,500,000	$55,000,000
2003	$1,075,960,000	$59,610,000
2004	$1,114,056,059	$61,634,200
2005	$1,124,983,552	$62,496,000

Source: U.S. Department of Education 2006b and 2006c

Data on the number of federally connected children associated with NWS Earle attending Tinton Falls schools is presented in Table 3-22. During the 2007-2008 school year, there were 82 NWS Earle federally connected students enrolled in Tinton Falls School District. During the 2000-2001 school year (when the military population at NWS Earle was considerably higher), there were four times as many federally connected students associated with NWS Earle enrolled in Tinton Falls School District. Similarly, the number of federally connected students associated with NWS Earle attending Monmouth Regional High School has dropped from near 50 in the 2002-2003 school year to 23 students in the 2007-2008 school year. Other federally connected students associated with Fort Monmouth also attend Monmouth Regional High School (see Chapter 5 Cumulative Effects for more details).

Tinton Falls and Monmouth Regional High School Districts have not historically received Section 8002 or 8007 funding.

Table 3-22 NWS Earle Federally Connected Students (2000-2001 through 2007-2008)

School	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Tinton Falls School District	330	232	188	192	124	112	90	82
Monmouth Regional High School District	N/A	N/A	47	39	33	21	28	23

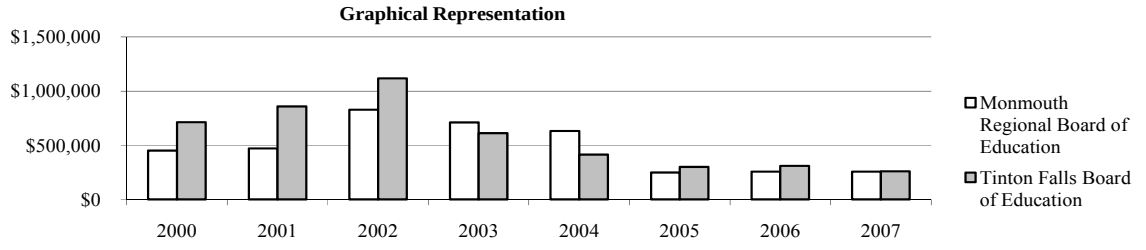
Source: Webster 2008 and Sydney-Gens 2008

Notes: N/A = not available. Includes military dependent students living at NWS Earle, both special and regular education.

Table 3-23 details the level of Section 8003 Federal Impact Aid provided to Monmouth County Board of Education and Tinton Falls Board of Education LEAs from 2000 to 2007. Final payments for fiscal years may be made several years after the year of the application. Final payments have not been received for fiscal years 2005 through 2007 (Dunham 2008). This includes payments from all federally connected students (i.e., includes federally connected students associated with Fort Monmouth and others). Overall, there is a marked decrease in payments from 2000 to 2007. Whereas Tinton Falls Board of Education received substantially more in Federal Impact Aid payments than Monmouth Regional Board of Education in 2000, payments between the LEAs were similar in 2007. It is notable that, in 2000, there were more federally connected children associated with NWS Earle as this was the timeframe when NWS Earle military strength and occupation of all NWS Earle housing areas was high.

Table 3-23 Section 8003 Federal Impact Aid Recipient Payments (2000-2007)

LEA	2000	2001	2002	2003	2004	2005	2006	2007
Monmouth Regional Board of Education	$450,130	$470,706	$827,620	$709,924	$631,469	$248,452	$255,622	$255,622
Tinton Falls Board of Education	$712,515	$858,471	$1,117,137	$611,796	$412,959	$299,507	$308,437	$258,437



Source: U.S. Department of Education 2006c, 2006d, 2008a, 2008b

3.3.1.4 U.S. Department of Defense Education Assistance

In 1991, Congress began supplementing "heavily-impacted" LEAs through the DoD authorization and appropriations bill in two programs called Assistance to Schools with Significant Numbers of Military Dependent Students (also called DoD Supplemental Impact Aid) and Impact Aid for Children with Severe Disabilities. In 1996, Congress added Assistance

to Schools with Enrollment Changes Due to Base Closures, Force Structure Changes, or Force Relocations or Impact Aid for Large Scale Rebasing.

The Deputy Under Secretary of Defense (Military Community and Family Policy) administers the Impact Aid Program for DoD and coordinates with other government activities to disburse payments to the eligible LEAs.

For FY 2006, Congress appropriated $30 million for the DoD Supplemental Impact Aid and an additional $5 million for districts educating severely-disabled military children. Congress also appropriated $7 million for Impact Aid for Large Scale Rebasing.

For FY 2007, Congress appropriated $30 million for the DoD Supplemental Impact Aid and an additional $5 million for districts educating severely-disabled military children. Congress also appropriated $8 million for Impact Aid for Large Scale Rebasing.

For FY 2008, Congress appropriated $30 million for the DoD Supplemental Impact Aid and an additional $5 million for districts educating severely-disabled military children. Congress did not appropriated funds for Impact Aid for Large Scale Rebasing.

Neither the Tinton Falls School District or the Monmouth Regional High School District have received funds through the DoD Supplemental Impact Aid Program. However, in the past both Districts have received aid through the DoD Impact Aid for Children with Severe Disabilities Program (Sydney-Gens 2008; Webster 2008).

Department of Defense Impact Aid for Children with Severe Disabilities Program

The DoD Impact Aid for Children with Severe Disabilities Program is available to any LEA that has at least two military dependent children with severe disabilities that meet certain special education cost criteria. The DoD works with LEAs to clarify or resolve any funding or disbursement eligibility issues.

Local Educational Agencies who meet the minimum criteria of having at least two military dependent children with disabilities will be contacted by the Deputy Under Secretary of Defense (Military Community and Family Policy) and invited to apply for the DoD Impact Aid for Children with Severe Disabilities Program. However, to actually qualify and receive a payment, the LEA:

1. Must serve two or more children with severe disabilities, for costs incurred in providing a free and appropriate education to each such child;

2. Must make payments only on behalf of children whose individual educational or related services cost exceeds either:

    - Five times the national or state average per pupil expenditure (whichever is lower) for a special education program that is located outside of the boundaries of the school district of the LEA that pays for the free and appropriate education of the student, or

- Three times the state average per pupil expenditure for a special education program offered by the LEA, or within the boundaries of the school district served by the LEA, and

- Schools must submit a Department of Defense Form 816 and 816C.

3.3.2 Law Enforcement

Naval Weapons Station Earle's police department is headquartered on NWS Earle in Building C-34. The department is responsible for providing law enforcement and security services throughout NWS Earle. Naval Weapons Station Earle police patrol, respond to incidents, issue citations, and detain individuals, as necessary. Because the Laurelwood housing area is located on federal exclusive jurisdiction, all infractions within this community are presently handled by federal law enforcement agencies through the federal court system (Sorrell 2008).

Although local police departments do not have jurisdictional authority on NWS Earle, they are responsible for law enforcement in the civilian community. The Colts Neck Township Police Department has one station located at 124 Cedar Drive in the Municipal Complex. The department is staffed with 22 full-time sworn law enforcement personnel and is equipped with 7 patrol cars, 2 unmarked patrol cars, and 1 vehicle designated for the Chief of Police.

The Colts Neck Township Police Department has adequate staff and equipment to provide the necessary level of service to the community (Chaszar 2007).

3.3.3 Fire and Medical Services

The NWS Earle fire department has 29 staff firefighters, with 10 firefighters on duty at all times. There are two stations; one is located at Building C-22 on the mainside of NWS Earle and the other is located at Building R-1 on the pier side of NWS Earle. Building C-22 is equipped with one rescue truck, one pump truck, one water tank truck, and one brush truck. Building R-1 is equipped with one pump truck, and one brush truck (Calcado 2007).

Colts Neck Fire Department (CNFD) has two fire companies: Company No. 1 is located in Colts Neck on Colts Neck Road and Company No. 2 is located on Conover Road. Company No. 1 is equipped with one ladder truck, one pump truck, one tank truck, one brush truck, and one utility vehicle. Company No. 2 is equipped with two pump trucks, two tank trucks, one brush truck, and one utility truck. All fire department personnel are volunteers. In 2007, there were 55 active volunteers between the two Companies. On average, the CNFD receives 450 to 500 calls per year. The CNFD is part of the Monmouth County Mutual Aid Task Force, which supplies mutual aid with neighboring districts and properties. On 25 June 2008, a mutual aid agreement was signed between the CNFD and the U.S. Navy. Under this agreement, CNFD and the NWS Earle fire department would assist one another if requested. In order to fight fires in Colts Neck Township, all water must be carried by trucks or pumped from local swimming pools, ponds, or streams. The CNFD is a member of the Monmouth County Mutual Aid Tanker Task Force,

which enables the department to draw water from surrounding towns. Currently, the CNFD is able to meet the community's needs (Savage 2007, CNFD 2007).

Naval Weapons Station Earle Emergency Medical Service (EMS) and basic medical services operate out of the station clinic and provide primary EMS response to housing areas at NWS Earle. The clinic attends to sick calls and performs physicals for government employees. The NWS Earle medical department is equipped with two ambulances (one active and one as a backup) that operate Monday through Friday during daytime hours and a limited EMS staff consisting of two Emergency Medical Technicians (EMTs), five ambulance drivers, one physician's assistant, and one doctor. The staff doctor shares time between NWS Earle and Naval Air Engineering Station Lakehurst located in Lakehurst, New Jersey. Emergency calls that cannot be managed by the base clinic are transferred to local hospitals. The Colts Neck First Aid Squad helps to support the station's EMS needs (Prezioso 2007) although there is no mutual aid agreement in place. The ambulance service was transferred over to the NWS Earle fire department in March 2008.

In the event of a trauma, emergency patients are transported to the comprehensive trauma and emergency care department at Jersey Shore University Medical Center in Neptune, New Jersey. In the event of other emergencies, patients are sent to any of the following local hospitals: Riverview Medical Center in Red Bank, Bayshore Community Hospital in Holmdel, Central State Medical Center in Freehold, and Monmouth Medical Center in Long Branch. These hospitals offer a variety of health care services in addition to emergency service to include family medicine, cancer services, pediatrics, dentistry, cardiology, and orthopedics (U.S. Navy 2004a).

Emergency medical service in Colts Neck Township is provided by the Colts Neck First Aid Squad, a volunteer organization which operates 24 hours a day, 365 days per year. In 2006, the Squad totaled 43 members, consisting of 34 EMTs and nine drivers. The Squad participates in a Mutual Aid and Disaster Management System with neighboring counties to supplement local emergency needs. On average, the Squad receives three to four calls per month from NWS Earle requesting aid. The Squad operates two ambulances and one rescue/ambulance vehicle, enabling the First Aid Squad to carry six patients at one time. The Squad also carries an airbag capable of lifting 52,000 lbs, several "jaws of life", power saws, cutters, and hydraulic rams. Currently, the First Aid Squad is able to meet the community's EMS needs (Engle 2007, Colts Neck First Aid Squad 2007).

3.3.4 Recreation

Residents at NWS Earle have recreational resources on-station available to them including sports fields, playgrounds, recreation centers, and a youth center. The Laurelwood housing area includes ten playgrounds, one tennis court, and four basketball courts (McCaffrey 2007a).

There are a number of recreational outlets throughout the Colts Neck community including twelve parks and open space areas which contain tennis and basketball courts, fitness courses,

trails, picnic areas, playgrounds, and sports fields (Colts Neck Township 2007a). The Monmouth County Park System consists of approximately 30 parks (including three beachfront areas), forests, gardens, wetland/marine habitats, golf courses, historic sites, recreation areas, and conservation properties totaling more than 14,000 acres (Monmouth County 2007a). Colts Neck Library is one of the eleven branch libraries within the Monmouth County Library System (Monmouth County 2007b). Monmouth County has 20 theatres to host cultural events, including Count Basie Theatre, PNC Bank Arts Center, and Pollak Theatre (Monmouth County 2009).

3.4 UTILITIES

For purposes of this EIS, infrastructure includes utilities such as electricity, telecommunications, natural gas service, potable water, wastewater treatment, solid waste collection and disposal, and stormwater management. The ROI for utilities encompasses the entire Station and the regional area that is serviced by a particular utility.

3.4.1 Electricity

Naval Weapons Station Earle receives electricity from the Jersey Central Power and Light distribution grid. Overhead electrical lines enter the Station at the East Gate on Esperance Road and feed the Navy's substation located along Esperance Road, approximately 0.5 mile west of the East Gate. From the substation, electricity is distributed by overhead lines throughout the Station. The electricity distribution within the Administrative area is through underground wires. On average, NWS Earle mainside consumes approximately 10,900,000 kilowatt hours (kWh) per year (Mahoney 2007).

The Laurelwood housing area also receives electricity from Jersey Central Power and Light. The 12.5 KV electrical feed provides electricity to the housing area via overhead lines originating at the intersection of Route 34 and Route 18. The overhead lines parallel the north boundary of the Station and continue to the Laurelwood site. The Laurelwood service connection is not part of the Navy's distribution grid.

According to NWS Earle personnel, there are currently no issues with respect to electricity demand and capacity at NWS Earle, including the Laurelwood housing area (Mahoney 2007). Additionally, according to Jersey Central Power and Light, there are no issues with respect to electricity demand and capacity at NWS Earle (including the Laurelwood housing area) and the Station has historically never exceeded capacity (Garbarini 2007). Currently, NWS Earle is responsible for paying the electricity bills to Jersey Central Power and Light for the Laurelwood housing area.

3.4.2 Telecommunications

Cable television service at NWS Earle, including the Laurelwood housing area, is provided by Cable Vision or satellite providers such as Direct Television (Direct TV). Verizon, AT&T, and Optimum are the chief providers of telephone service (McCaffrey 2007c). The services are

provided to each housing unit on an individual request basis. Billing for these services is per individual unit.

3.4.3 Natural Gas

Natural gas service is provided to NWS Earle, including the Laurelwood housing area, by New Jersey Natural Gas. New Jersey Natural Gas owns and maintains the gas lines that provide service to the Laurelwood housing units at NWS Earle. The developer of the Laurelwood housing area is a gas master meter operator. Natural gas at Laurelwood is individually metered by building. Currently, NWS Earle is responsible for payment of natural gas bills to New Jersey Natural Gas to include the Laurelwood housing area. Naval Weapons Station Earle consumed approximately 408,519 therms (approximately 40.9 billion Btu) in 2006 (Mahoney 2007).

According to NWS Earle personnel, there are currently no issues with respect to natural gas demand and capacity NWS Earle, including the Laurelwood housing area (Chizmadia 2007). Additionally, according to New Jersey Natural Gas, there are no issues with respect to natural gas demand and capacity at NWS Earle, including the Laurelwood housing area (Lin 2007).

3.4.4 Potable Water

Potable water at NWS Earle is provided by the New Jersey American Water Company, a subsidiary of American Water. The potable water supply is derived from surface water intakes, reservoirs, and deep wells, though no wells or surface water intakes are located on NWS Earle (U.S. Navy 2003a). The primary water source of New Jersey American Water Company, the Swimming River Reservoir, has a total storage capacity of 2.6 billion gallons (Colts Neck Township 2004). However, potable water for NWS Earle primarily comes from the Glendola Reservoir and the Manasquan Reservoir (Dugandzik 2008). Potable water is distributed to the housing areas, including Laurelwood, through NWS Earle's distribution system. The Station is considered a Public Community Water Distribution System by the NJDEP (Ely 2007a).

Naval Weapons Station Earle holds a Safe Drinking Water Act Permit (No. 1148) which is reviewed yearly, and the Station's Public Works Department conducts quarterly analysis of potable water quality (U.S. Navy 2003a). In recent years, NWS Earle has experienced occasional high trihalomethane levels in the water supply and is required to notify all users on the NWS Earle water distribution system when levels exceed the regulatory level. Trihalomethanes are by products of the disinfection process. According to Base personnel, NWS Earle has exceeded regulatory levels for trihalomethanes for the period 2004 through 2006 and sent public notification letters during November 2006 and February 2007. Naval Weapons Station Earle has been in compliance since February 2007 (Ely 2007a). The U.S. Environmental Protection Agency (USEPA) standard for trihalomethanes is 80 parts per billion (ppb). Naval Weapons Station Earle, with the cooperation of the local water company, has moved aggressively to improve water quality by instituting a water flushing program, isolating areas of the water system with low usage, and improving the quality of the water entering the station. The program

has resulted in NWS Earle meeting the regulatory requirements for trihalomethanes for the year 2007. Naval Weapons Station Earle continues to monitor water quality.

Base personnel indicate that potable water capacity is not an issue. Since 1988, the year that the Station began purchasing water from New Jersey American Water Company, there have been no instances of capacity issues with potable water at NWS Earle. According to potable water usage data, the base consumed 48.2 million gallons in total or approximately 0.132 million gallons per day (mgd) during 2006 (Ely 2007b). During the year 2000, which represents a time period with the greatest number of families living at the Station, NWS Earle consumed 114.7 million gallons in total or approximately 0.31 mgd (Ely 2007b). Naval Weapons Station Earle is not allocated a specific volume of potable water per day; rather, the Station is simply billed for the amount of potable water it consumes (Ely 2007a). According to the New Jersey American Water Company there are currently no capacity issues associated with the reservoirs from which NWS Earle obtains its potable water supply (Dugandzik 2008).

3.4.5 Wastewater

Naval Weapons Station Earle Public Works Department owns, operates, and maintains a wastewater treatment plant which provides service to administrative and housing areas located at mainside (NWS Earle 2003). Constructed in 1944, the facility was upgraded in 1993. The wastewater treatment plant utilizes tertiary treatment prior to discharge (Ely 2007a). All housing areas on base are connected to the wastewater treatment plant, including the Laurelwood housing area. The facility's treatment capacity is 0.37 mgd, with current usage at 0.08 mgd (U.S. Navy 2003a and Ely 2007c). Therefore, there are no capacity issues related to the use of this facility.

Colts Neck Township, which surrounds that part of the base containing housing areas, does not have any municipal or private treatment or collection system for handling domestic wastewater. All domestic wastewater within the township is handled using individual or small group septic systems. Within the township, some nonresidential users have constructed individual treatment plants that perform primary, secondary, and tertiary sewerage treatment. Currently, the township has six sites that have constructed onsite treatment plants (Colts Neck Township 2004).

3.4.6 Solid Waste Disposal

In fiscal year 2007, NWS Earle disposed of approximately 191 tons of trash and generated approximately 45 tons of recycled material (Dziedzicki 2007). Solid waste at NWS Earle housing areas is picked up at curbside by a private contractor and transported to the Monmouth County Reclamation Center located in Tinton Falls (Dziedzicki 2007). Costs for disposal vary according to the type of waste received and the facility has no minimum limit for waste disposal. Customers disposing of municipal and household solid waste are charged $71.60 (including tax) per ton while customers disposing of construction and demolition waste are assessed a fee of $104.60 (including tax) per ton (Monmouth County 2007c). Monmouth County Reclamation Center has sufficient capacity to serve the needs of the county through 2015, with room for expansion after that (Monmouth County 2006). Usage peaked in 1987 when the county accepted

790,000 tons of solid waste; since mandatory recycling began in 1987, usage declined to an average of 500,000 tons per year (Monmouth County 2006).

3.4.7 Stormwater Management

The housing areas at NWS Earle are governed by the NJDEP Stormwater Phase II regulations which regulate the quantity and quality of stormwater flows from parking lots, roadways, fields and construction sites. In 1994, the NJDEP issued NWS Earle a New Jersey Pollutant Discharge Elimination System (NJPDES) Permit under the state's General Permit for discharges of stormwater for the areas of mainside, which includes the installation's light industrial activities such as maintenance shops and equipment cleaning operations (U.S. Navy 2003a). In 2004, NWS Earle was reissued a NJPDES Permit to discharge stormwater under the General Permit number NJG0148822 (NWS Earle 2007b).

The Station's stormwater drainage system includes a combination of ditches, culverts, retention basins, and reinforced concrete and corrugated metal piping. One stormwater retention basin is located on the east side of the Laurelwood housing area. There are 12 stormwater outfall locations at NWS Earle mainside (NWS Earle 2007b). One of these outfalls collects stormwater from the housing areas within the cantonment area. The stormwater flow from the Green Acres, Green Drive, Stark Road and the Laurelwood housing areas is discharged to Hockhockson Brook. Hockhockson Brook and Ware Creek ultimately flow to the Atlantic Ocean (NWS Earle 2003).

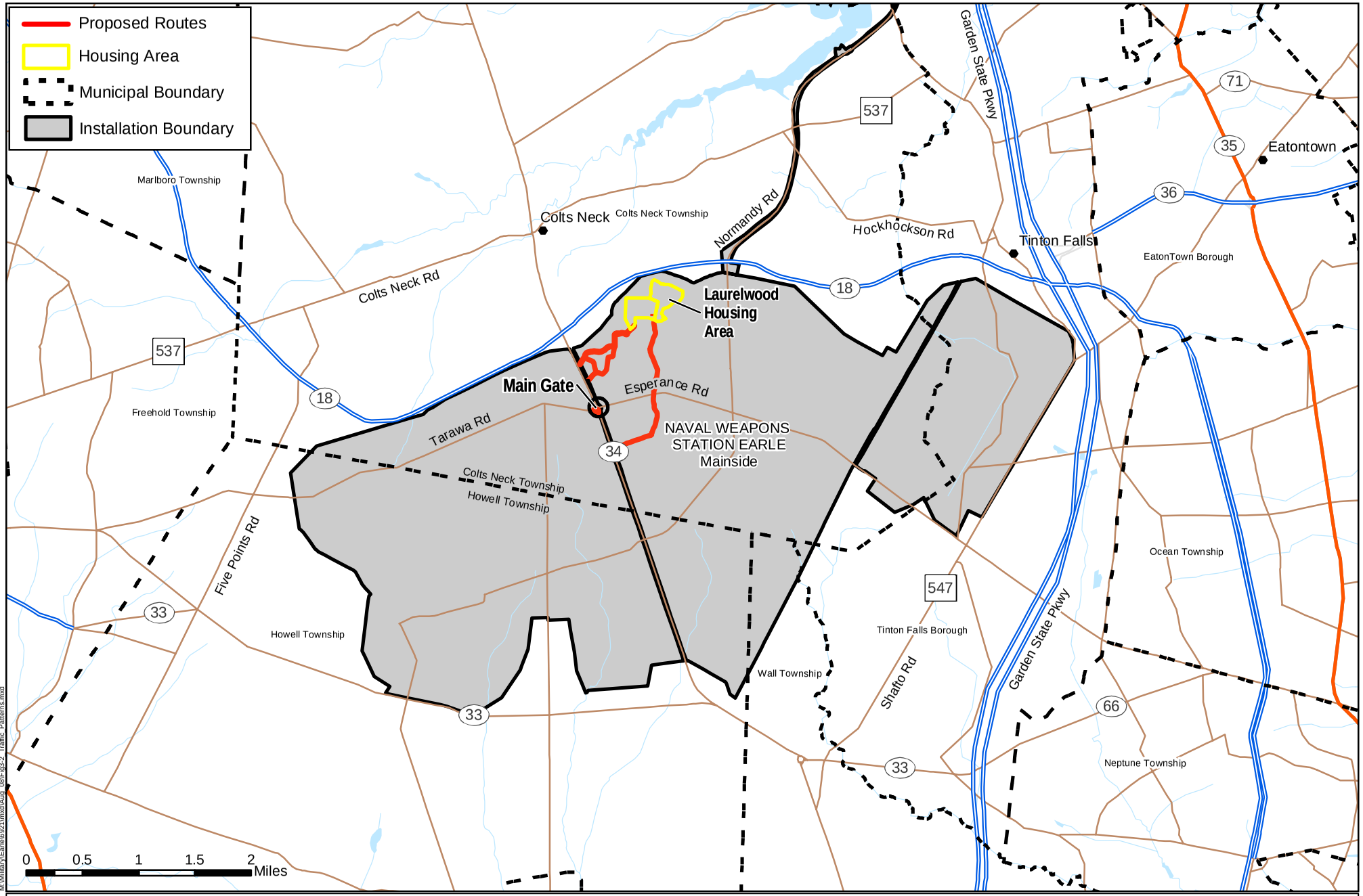
3.5 TRAFFIC

The ROI for traffic includes the main station at NWS Earle, with an emphasis on the administrative areas of the base, as well as the local road network that provides access points to the station to include Route 34, Route 18, Normandy Road, Route 33, Colts Neck Road (Route 537), and Hockhockson Road.

3.5.1 Existing Conditions

The populated portion of NWS Earle mainside is located within the southeast quadrant of the interchange of Route 34 and the Route 18 expressway in the Colts Neck Township. The following is a description of the existing roadways and intersections within the study area (Figure 3-2).

Route 34 is a north-south State highway providing one through-travel lane in each direction, with the exception of the area near the interchange with Route 18 which provides two lanes in each direction. South of the Esperance Road traffic signal, the NJDOT classifies this roadway as a Rural Minor Arterial; between Esperance Road and Route 18 it is classified as an Urban Minor Arterial, and north of Route 18 it is classified as an Urban Principal Arterial. The posted speed limit on Route 34 throughout the study area is 50 mph.



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Figure 3-2
Traffic Patterns in the vicinity of NWS Earle

Approximately 2.75 miles south of the Esperance Road signal, Route 34 intersects Route 33 at a partially grade-separated interchange with left-turn and U-turn connectors. Between the Esperance Road and Route 33 intersections, there are no roadway intersections with Route 34, although there are three residences, formerly associated with the base.

Esperance Road (formerly known as Asbury Avenue) extends east from Route 34 at a point roughly 0.75 mile south of the Route 18 interchange and provides the primary access to the main base. This base access is secured; vehicles entering the base at this point are subject to search. The intersection of Route 34 and Esperance Road is controlled by a traffic signal under the jurisdiction of the NJDOT. Another base-maintained roadway (Tarawa Road) extends west from Route 34 opposite Esperance Road, forming a 4-leg intersection (see Figure 2-1).

Route 18 (the WWII Veteran's Memorial Highway) is a limited-access expressway running in a generally east-west direction within the study area (though the overall highway is posted as north-south). The speed limit on Route 18 in this area is 65 mph. Route 18 intersects Route 34 at a full cloverleaf interchange, providing free-flowing access between the two roadways in all directions. The nearest interchange to the south/east is at Wayside Road, approximately 4.5 miles from Route 34.

Colts Neck Road (Route 537) runs generally east-west through the study area and is under Monmouth County jurisdiction, providing one through-travel lane in each direction in the study area. Its intersection with Route 34 is located roughly 4,960 feet north of the Route 18 interchange and is controlled by a traffic signal. Separate left- and right-turn lanes are provided on the Route 34 approaches to this traffic signal. On the Colts Neck Road approaches, no left-turn lanes are striped; however, under observations for this study, as well as prior studies for Monmouth County, each approach functions as if a short left-turn lane were provided. However, capacity analysis for this intersection assumes only one lane, since queues of left-turning vehicles are often of sufficient length to block through traffic.

In the area of the intersection with Route 34, the posted speed limit on Colts Neck Road is 40 mph. Elsewhere, including the area of the Hockhockson Road intersection, the posted speed limit on Colts Neck Road is 50 mph.

Hockhockson Road is a two-lane roadway under Colts Neck Township jurisdiction, extending south from Colts Neck Road at a point roughly 2.5 miles east of the traffic signal at Route 34 at Colts Neck Road. Hockhockson Road forms a T-intersection with Colts Neck Road. The northbound Hockhockson Road approach to Colts Neck Road is controlled by a Stop sign; no supplemental turning lanes are provided at this intersection, although the wide Hockhockson Road approach occasionally functions as if it provided two lanes. Roughly 1,000 feet to the south of Colts Neck Road, Hockhockson Road intersects Normandy Road; this intersection is controlled by a traffic signal.

Normandy Road is a two-lane roadway controlled by the U.S. Government and is used to connect mainside with the waterside piers at Sandy Hook Bay near Keyport, to the northeast.

Within this area, Normandy Road is paralleled by a railroad track, also used for transport between the mainside and waterside areas of NWS Earle. As noted previously, Normandy Road intersects Hockhockson Road at a traffic signal, which is actuated by Normandy Road traffic. Traffic volumes on Normandy Road are minimal, and this signal rarely displays a red signal to Hockhockson Road. Signage on Normandy Road is posted to deny unauthorized entry to the base. Normandy Road, and the parallel railroad tracks, cross Route 34 and Colts Neck Road via under- and overpasses, respectively.

Route 33 is an east-west State highway providing one through travel lane in each direction. Route 33 intersects Route 34 at a point approximately 2.75 miles south of the traffic signal at Esperance Road; this intersection includes some grade-separated movements with left-turn and U-turn connectors.

3.5.2 Existing Traffic Volumes

A Traffic Study was completed in May 2008 and revised in February 2009 (U.S. Navy 2008b) that presented baseline traffic conditions in the ROI. To quantify the traffic volumes using the roadways in the study area, the Traffic Study conducted manual turning movement counts, and automated traffic recorder (ATR) "tube" counts for traffic volume, at the following locations:

Manual Turning Movement Counts:

- Route 34 and Route 33 (including eastbound Route 33 through and left-turn movements, and northbound Route 34 movements);
- Route 34 and Esperance Road;
- Route 34 and Colts Neck Road;
- Colts Neck Road and Hockhockson Road.

Automated Traffic Recorder Counts, conducted in November 2007 unless otherwise noted:

- Route 34 between Route 33 and Esperance Road (Routes 33 and 34 meet at two separate intersections. The study focuses on the northern intersection of the two routes, and not the traffic circle farther to the south at County Route 547);
- Route 34 between Esperance Road and Route 18;
- Route 34 Northbound ramp to Route 18 Southbound;
- Route 18 Southbound ramp to Route 34 Southbound, counted in February, 2009;
- Route 18 Southbound ramp to Route 34 Northbound, counted in February, 2009;
- Route 34 Northbound ramp to Route 18 Northbound, counted in February, 2009.

Manual turning movement counts were conducted between November 8 and November 15, 2007, from 7:00 to 9:00 AM, and from 4:00 to 6:00 PM. A traffic count program was conducted at NWS Earle in 2004. The current study compared the existing baseline peak period traffic volumes with those collected in 2004 at the same locations. For the most part traffic volumes in the study area appear to have remained relatively constant. Traffic volumes and directional patterns at the two Colts Neck Road intersections and the intersection of Route 34 and Esperance Road are very similar. It is also noted that peak period traffic volumes at the intersection of Routes 33 and 34 in the southern portion of the study area are somewhat lower than observed during the 2004 counts.

3.5.3 Existing Peak Period Levels of Service

While traffic volumes provide an important measure of activity on the area road system, evaluating how well that system accommodates those volumes is also important, i.e., it is important to compare peak traffic volumes with available roadway capacity. By definition, capacity represents the maximum number of vehicles that can be accommodated given the constraints of roadway geometry, environment, traffic characteristics, and traffic controls.

Intersections control capacity in road networks, since conflicts exist at these points between through, crossing, and turning traffic. Because of these conflicts, congestion is most likely to occur at intersections. Therefore, intersections are studied most often when determining the quality of traffic flow.

Although an unsignalized intersection on a through route is seldom critical to the overall capacity of the through route, it may significantly affect the capacity of the minor cross route and it may influence the quality of traffic flow on both. When analyzing unsignalized intersections, major street through movements and right turns are unimpeded and have the right-of-way over all side street traffic and left turns from the major street. All other turning movements in the intersection cross, merge with, or are otherwise impeded by major street movements.

Traffic delays at unsignalized intersections are determined by sequentially processing these impeded movements. For each impeded movement in turn, all conflicting flows are summed. It should be noted that the Transportation Research Board Highway Capacity Manual (HCM) (Transportation Research Board 2003) assumes a random arrival for all the movements, which is not always the case (i.e., an adjacent signal will 'platoon' vehicles).

Since operation at full capacity is usually unsatisfactory to most drivers, a descriptive concept has been developed for unsignalized intersections called Level of Service (Transportation Research Board 2003). Level of Service (LOS) relates expected traffic delay to critical movement. Unsignalized LOS ranges from LOS ‘a’ (coded lower case, indicating average delays of 10 seconds or less) to LOS ‘f’ (indicating average delays of greater than 50 seconds). LOS ‘e’ is generally considered as the acceptable limit of delay for most drivers in a suburban setting (Transportation Research Board 2003). A more detailed level of service description for unsignalized intersections is summarized in Table 3-24.

Table 3-24 Level of Service and Expected Delay for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (seconds)
a	0 to 10.0
b	10.1 to 15.0
c	15.1 to 25.0
d	25.1 to 35.0
e	35.1 to 50.0
f	over 50.0

Source: Highway Capacity Manual, published by the Transportation Research Board, Washington, DC, 2003. (Transportation Research Board 2003)

At signalized intersections, factors that affect the various approach capacities include width of approach roads, number of lanes, signal 'green time', turning percentages, truck volumes, etc. However, operation at full capacity can be less than satisfactory since substantial delays or reduced operating speeds are likely. Delays cannot be related to capacity in a simple one-to-one fashion. It is possible to have delays in the LOS 'F' (coded in capitalized letters) range without exceeding roadway capacity. Substantial delays can exist without exceeding capacity if one or more of the following conditions exist:

- long signal cycle lengths;
- a particular traffic movement experiences a long red time; or,
- progressive movement for a particular lane group is poor.

Table 3-25 describes the level of service ranges for signalized intersections.

Table 3-25 Level of Service and Expected Delay for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (seconds)
A	0 to 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	over 80.0

Source: Highway Capacity Manual, published by the Transportation Research Board, Washington, DC, 2003. (Transportation Research Board 2003)

Level of Service is further defined in the HCM as "a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience." (Transportation Research Board 2003) Six levels of service, ranging from A to F, with A representing the optimum operating conditions and F representing congestion, are defined to represent operating conditions. Typically ratings to LOS D are acceptable to certain degrees. Ratings beyond LOS D to down to LOS E and LOS F, result in critical delays and failures and a breakdown in the ability of the traffic network to satisfactorily accommodate traffic.

Figures 3, 4 and 5 in Appendix A present the existing levels of service for the weekday morning and evening peak periods, respectively, at the study area intersections counted as part of this study (and as presented as volumes in Appendix A, Figures 1, 2 and 3). An evaluation of the traffic operation at each intersection in the study area follows:

3.5.3.1 Route 34 and Esperance Road

Under existing conditions, the Route 34 movements operate at LOS 'C' or better, with the exception of the northbound through movement which operates at LOS 'E' during the morning peak period (see Table 3-26). The westbound Esperance Road approach to Route 34 operates at LOS 'E' during the morning peak period, and level 'D' during the evening peak period. From onsite observations, it appears that the LOS 'D'/'E' operation is more a function of long red light times for the side street rather than high traffic volume. During manual counting only one vehicle was counted for the eastbound Esperance Road approach for the morning peak period. As a result, an LOS 'D' was assigned. No vehicles were counted during the evening peak hour.

Table 3-26 Existing Level of Service for Intersections

Weekday Morning Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Esperance Rd	A	E		C	A		D			E			D
Rt. 34 & Colts Neck Rd	C	F	C	C	D	D	F			F			F
Rt. 34 & Rt. 33							c						
Colts Neck Road & Hockhockson Rd	c (L-R only)									a			
Rt. 34 & Rt. 18	A (weave)												

Weekday Evening Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Esperance Rd	A	B		B	B					D			B
Rt. 34 & Colts Neck Rd	C	D	C	C	D	D	F			F			F
Rt. 34 & Rt. 33							c						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			
Rt. 34 & Rt. 18				B (merge)									

Capital letters are used for intersections controlled by traffic signals. Lower case letters are used for unsignalized intersections. Gray cells indicates absence of a LOS classification for that specific segment of an intersection; either the traffic is considered 'freeflowing' and is not impeded by cross traffic or the direction may not pertain to that specific intersection. Overall ratings are not provided for unsignalized intersections because they are skewed by heavy volumes of through traffic that experience no delay. Source: U.S. Navy 2008b

3.5.3.2 Route 34 and Colts Neck Road (Route 537)

At this intersection, there are several deficient movements (i.e., operating at LOS 'E' or 'F') during the morning and evening peak periods (Table 3-26). These are as follows.

- The northbound Route 34 through movement operates at level 'F' during the morning peak period.
- The eastbound and westbound Colts Neck Road approaches operate at LOS 'F' during both peak periods, with average delays of several minutes per vehicle.
- During both peak periods, the overall (volume-weighted) intersection LOS is 'F.'

3.5.3.3 Route 34 and Route 33

The capacity analysis only included the eastbound left-turn and U-turn movement from Route 34 south/Route 33 east, onto Route 34 northbound, since this is the only conflicting movement at this interchange that will be affected by traffic associated with the proposed action. This left turn movement at the unsignalized intersection operates at LOS 'c' during the weekday morning and evening peak periods (Table 3-26).

3.5.3.4 Colts Neck Road and Hockhockson Road

The westbound Colts Neck Road through/left turn movement operates at level 'a' during both peak periods (Table 3-26). The northbound Hockhockson Road approach operates at level 'c' and 'd' during the weekday morning and weekday evening peak periods, respectively.

3.5.3.5 Route 34 and Route 18

The Route 34 and Route 18 interchange is a high capacity, full movement, eight-ramp interchange serving all movements with only merge/diverge ramps and no stop signs or traffic signals. The New Jersey Access Code [16:47-4.36 (a) 2] provides thresholds that trigger a traffic impact analysis for intersections. Specifically, a vehicular conflict point must be analyzed for:

> Those locations exceeding both 100 new trips during the critical peak hour(s), determined in accordance with the New Jersey Access Code [16:47-4.30(d)1i] and 10 percent of the anticipated daily site traffic, shall be analyzed. (NJDOT 1997)

The analysis of traffic expected to be generated from the proposed action (see Section 4.5) found that only the weekday morning peak hour northbound weave section for Alternative Alignment 1 and the weekday evening peak hour southbound merge section for Alternative Alignment 1 met this threshold. This is due primarily to the proposed configuration of Alternative Alignment 1 as a right-turn entry and exit access road (see Section 2.4.2.1). No single ramp merge area or weave section will experience an increase of 100 peak hour trips under Alternative Alignments 2, 3, or 4 (U.S. Navy 2008b). Therefore, Table 3-26 (and all other tables designating LOS) in the EIS show LOS only for the morning peak hour northbound weave and the evening peak hour southbound merge.

The northbound weave section of the intersection operates at level 'A' during the weekday morning peak hour. The southbound merge section of the intersection operates at level 'B' during the weekday evening peak hour (see Table 3-26).

3.6 AIR QUALITY

The ROI for air quality is defined by the regulatory boundary of the Consolidated Metropolitan Statistical Area of New York-Northern New Jersey-Long Island NY (NY-NJ-CT-PA), comprised of 31 counties located in New York, New Jersey, and Connecticut as well as Pikes County, Pennsylvania. The specific local area of interest within this Consolidated Metropolitan Statistical Area is Monmouth County, New Jersey, where NWS Earle is located.

Understanding air quality for the affected area requires knowledge of:

- applicable regulatory requirements;
- types and sources of emissions (for stationary sources) and the horizontal and vertical extent of emissions from mobile sources;
- location and context of the affected area associated with the proposed action; and
- existing conditions (or affected environment).

3.6.1 Regulatory Requirements

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The Clean Air Act (CAA) and its subsequent amendments (42 U.S.C. §§ 7401 et seq.) established the National Ambient Air Quality Standards (NAAQS) for seven "criteria" pollutants:

- ozone (O_3);
- carbon monoxide (CO);
- nitrogen dioxide (NO_2);
- sulfur dioxide (SO_2);
- particulate matter (PM) less than 10 microns (PM_{10});
- PM less than 2.5 microns ($PM_{2.5}$); and
- lead (Pb).

These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Short-

term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects (Table 3-27).

Long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. The NJDEP, Division of Air Quality has adopted the NAAQS, as well as maintaining some state-specific standards. These air quality standards are presented below.

3.6.2 Regional Air Quality

Mainside NWS Earle is located in Monmouth County, New Jersey, which is part of the NY-NJ-CT-PA Consolidated Metropolitan Statistical Area. This Area is classified by the USEPA as nonattainment for two criteria pollutants: ozone and $PM_{2.5}$ (USEPA 2007b). Additionally, a portion of Monmouth County was nonattainment for CO at one time. While it is now considered attainment for this criteria pollutant, this area is designated as a Maintenance Area.

Table 3-27 National and New Jersey Ambient Air Quality Standards[a]

	AVERAGING TIME	NATIONAL PRIMARY[b]	NATIONAL SECONDARY[c]	NEW JERSEY
Ozone (O_3)	8 Hours	0.075 ppm[d]	Same as Primary	
Carbon Monoxide (CO)	8 Hours	9.0 ppm	None	9.0 ppm (secondary)
	1 Hour	35 ppm		35 ppm (secondary)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm	Same as Primary	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.03 ppm	None	0.02 ppm (secondary)
	24 Hours	0.14 ppm		0.01 ppm (secondary)
	3 Hours		0.5 ppm	
Particulate Matter (PM_{10}) [e]	24 Hours	150 µg/m^3	Same as Primary	
Particulate Matter ($PM_{2.5}$) [f]	Annual	15 µg/m^3	Same as Primary	
	24 Hours	35 µg/m^3 [f]		
Total Suspended Particulate Matter (TSP)	Annual			75 µg/m^3 (primary) 60 µg/m^3 (secondary)
	24 Hours			260 µg/m^3 (primary) 150 µg/m^3 (secondary)
Lead (Pb)	Quarterly Arithmetic Mean	1.5 µg/m^3	Same as Primary	

a: These standards, other than for ozone and those based on annual averages, must not be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.

b: National primary standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

c: National secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a regulated air pollutant.

d: ppm = parts per million by volume, µg/m^3 = micrograms per cubic meter.

e: USEPA promulgated new standards for Particulate Matter, including removal of the PM_{10} annual standard. This revision went into immediate effect in September 2006.

f: USEPA promulgated new standards for $PM_{2.5}$ 24-hour standard, from 65 ug/m^3 to 35 ug/m^3. This revision went into effect in December 2006 and areas in nonattainment will be designated by April 2010.

Source: Federal Code of Regulations, Title 40, Protection of the Environment, Chapter I, Environmental Protection Agency, Subchapter C, Air Programs; New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 13. 1991. *Ambient Air Quality Standards.*

Ozone

The ambient air quality standard for O_3 was revised from a 1-hour standard to an 8-hour standard in 2004. Under the 8-hour standard, the NY-NJ-CT-PA Consolidated Metropolitan Statistical Area is classified as "Subpart 2 moderate nonattainment."

The CAA contains two sets of provisions, subpart 1 and subpart 2, that address planning and control requirements for nonattainment areas. Subpart 1 (which is referred to as "basic") nonattainment contains general, less prescriptive, requirements for nonattainment areas for any pollutant—including O_3—governed by a NAAQS. Subpart 2 sets forth a classification scheme for O_3 nonattainment areas and provides more specific requirements for O_3 nonattainment areas. Under subpart 2, areas are classified based on each area's O_3 design value. Control requirements depend on an area's subpart 2 classification. Areas with more serious O_3 pollution are subject to more prescribed requirements and are given longer to attain the standard. The requirements are designed to bring areas into attainment by their specified attainment dates.

In the Phase 2 implementation rule, USEPA will address the control obligations that apply to areas under both subpart 1 and subpart 2. Subpart 2 areas are classified as marginal, moderate, serious, or severe based on the area's 8-hour design value calculated using the most recent 3 years of data. At this time, there are no areas with design values in the extreme or severe 15 classification for the 8-hour O_3 standard. As described in the Phase 1 implementation rule, since Table 3-28 is based on 1-hour design values, USEPA promulgated in that rule a regulation translating the thresholds in Table 1 of section 181 from 1-hour values to 8-hour values (See Table 3-28, below).

Table 3-28 Classification for 8-Hour O_3 NAAQS[1]

Area Class		8-Hour Design Value ppm	Attainment deadline in years[2]
Marginal	From Up to[3]	0.085 0.092	3
Moderate	From Up to[3]	0.092 0.107	6
Serious	From Up to[3]	0.107 0.120	9
Severe-15	From Up to[3]	0.120 0.127	15
Severe-17	From Up to[3]	0.127 0.187	17
Extreme	Equal to or above	0.187	20

[1] *from* 40 CFR 51.903
[2] after effective date of nonattainment designation for 8-hour NAAQS
[3] but not including.

$PM_{2.5}$

"Fine particles," such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. The USEPA uses the term "$PM_{2.5}$" to describe this fraction of particulate matter that exists in air pollution.

The USEPA readopted the existing annual $PM_{2.5}$ standard, and adopted a revised 24-hour standard in 2006. The new 24-hour $PM_{2.5}$ NAAQS was lowered from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. State recommendations for designating nonattainment areas for the 24-hour standard were due to the USEPA no later than December 18, 2007.

Currently, Monmouth County is in a nonattainment area for the annual $PM_{2.5}$ standard, and New Jersey has recommended that the county be included as nonattainment for the 24-hour $PM_{2.5}$ standard. The USEPA's final designations should be available sometime during the first half of 2009.

Carbon Monoxide Maintenance Area

A total of 14 counties within the NY-NJ-CT-PA Consolidated Metropolitan Statistical Area are classified as "moderate" maintenance areas, and a portion of Monmouth County is considered an "unclassified" maintenance area for CO. The Borough of Freehold has been designated a CO maintenance area since 1996. Mainside NWS Earle is located adjacent to this area. The purpose of assigning the designation "maintenance area" is to ensure that the state and locality continue to take measures to ensure that attainment is maintained and that the area does not relapse into nonattainment. On July 10, 2006, the USEPA approved an updated 10-year CO maintenance plan for nine areas of New Jersey that were "unclassified," which includes the Borough of Freehold.

3.6.3 Local Air Quality

A locality's air quality status and the stringency of air pollution standards and regulations depend on whether monitored pollutant concentrations attain the levels defined in the NAAQS. Ambient air quality concentrations are expressed in parts per million or micrograms per cubic meter, but the standard used for describing existing and proposed air emissions is expressed in tons of pollutant per year. To ensure the NAAQS are achieved and/or maintained, the CAA requires each state to develop a State Implementation Plan (SIP). According to the plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants. As discussed in the previous section, the Monmouth County area, which includes mainside NWS Earle does have special requirements due to nonattainment for two criteria pollutants, and requirements associated with a designated CO maintenance area.

3.6.3.1 General Conformity

In addition, the CAA provides that federal actions occurring in nonattainment and maintenance areas shall not hinder future attainment with the NAAQS and will conform to the applicable SIP (i.e., New Jersey's SIP). The CAA also establishes a national goal of preventing degradation or impairment in any federally-designated Class I area. The greatest degree of air quality protection is allocated to certain national parks and wilderness areas. These "Class I" areas are national parks or national wilderness areas that were so designated as of August 7, 1977 , and that are greater than 6,000 acres (parks) or 5,000 acres (wilderness). There are 21 units of the National Wildlife Refuge System, 48 units of the National Park System, and 88 U.S. Forest Service Wilderness Areas designated as Class I areas.

In Class I areas, visibility impairment is defined as a reduction in visual range and atmospheric discoloration. Stationary sources, such as industrial complexes, are typically an issue for visibility within a Class I PSD area.

Brigantine Wilderness Area, located in New Jersey, is a Class I area located approximately 62 miles from the proposed action location.

3.6.4 Types and Sources of Air Quality Pollutants

Pollutants considered in this EIS are SO_2 and other compounds (i.e., oxides of sulfur or SO_x); volatile organic compounds (VOCs), which are precursors to O_3; nitrogen oxides (NO_x), which are also precursors to O_3, and include NO_2 and other compounds; CO; $PM_{10;}$ and $PM_{2.5}$. These criteria pollutants are generated by the types of activities (e.g., construction and mobile source operations) associated with the proposed action alternatives. Airborne emissions of lead are not included because there are no known significant lead emissions sources in the region or associated with the proposed action alternatives.

3.7 NOISE

Noise is the term used to identify disagreeable, unwanted sound that interferes with normal activities or diminishes the quality of the environment (United States Army Center for Health Promotion and Preventive Medicine [USACHPPM] 2006). When sounds interfere with our speech, disturb our sleep, or interrupt routine tasks, they become noise. For the purposes of this EIS, the ROI for noise encompasses the area that would be affected by noise generated from construction activities and increased traffic associated with providing unimpeded access to the Laurelwood housing area. The affected environment for land-based construction noise encompasses the area within a 177-foot radius of the areas of potential construction associated with providing unimpeded access to the Laurelwood housing area, which is further explained in the following subsections.

3.7.1 Background

Within this EIS, noise is described by the sound intensity (or level) and measured in units called decibels (dB). The dB system of measuring sound provides a simplified relationship between the physical intensity of sound and its perceived loudness to the human ear. The dB scale is logarithmic; therefore, sound intensity increases or decreases exponentially with each dB of change. For example, 10-dB yields a sound level 10 times more intense than 1 dB, while a 20-dB level equates to 100 times more intense, and a 30-dB level is 1,000 times more intense.

The ambient (or surrounding) noise level of an area, like NWS Earle, includes sounds from both natural (wind, birds) and artificial (vehicle engines, horns) sources. The strength/extent (or magnitude) and frequency of sound levels vary over the course of the day, throughout the week, and can be affected by weather conditions. For low-frequency sounds that can cause vibrations, a C-weighting metric is used; noted as dBC. Many find that these lower frequency sounds are more annoying than other noises, so that is taken into account in this C-weighted metric. An A-weighted noise metric is used to reflect what people hear, noted as dBA. A-weighting is typically applied to measuring noise for activities such as construction engine equipment and aircraft take-offs and landings. Both metrics screen out very high and low sound frequencies that cannot be heard by humans.

Noise Perception

A number of variables influence the reactions people have to noise, including intensity (how loud the noise is), duration (does it last a second or an hour), repetition (does it occur every day or once a month), abruptness of the onset or stoppage of the noise (does it startle or come about at unpredictable times), background noise levels (does the noise occur in an urban or rural environment), interference with activities (does it interrupt phone conversations, listening to the radio, or television), previous community experience with the noise (some neighbors may have lived there for most of their lives, some may be new), time (does noise occur in the middle of the day or night), fear of personal danger from the noise sources (e.g., gunfire), and extent that people believe the noise can be controlled (USACHPPM 2006).

Noise impacts result from perceptible changes in the overall noise environment that increase annoyance or affect human health. Noise can cause human health effects such as hearing loss and noise-related awakenings. Annoyance is a subjective impression of noise wherein people apply both physical and emotional variables. To increase annoyance, the cumulative noise energy must increase measurably. Table 3-29 presents sound levels in dBs for typical sounds found in our environment and the reaction that might occur when a person (or receptor) is exposed to this noise.

The most applicable federal guidelines for noise and vibration derive from the Federal Transit Administration (FTA). The FTA guidelines classify three categories of land use with special sensitivity to noise (FTA 2006). They are:

- buildings or parks where quiet forms a basic element of their purpose;

- residences and buildings where people normally sleep (e.g., homes, hotels, hospitals) where nighttime noise is most annoying; and

- institutional land uses (e.g., schools, libraries, active parks, churches) with primarily daytime and evening use.

3.7.2 Noise Environment at NWS Earle

The existing noise environment at mainside NWS Earle is that of a typical military weapons station, and most of the on-station noise can be associated with vehicular and occasional rail traffic. Rail traffic at NWS Earle consists of two locomotives that make one round trip daily from mainside to the pier complex when operations are in progress. On mainside, the railway parallels Normandy Road. Operations generally occur during the five-day workweek, but may occur on weekends as necessary. Rail traffic also moves along a rail line near the Laurelwood housing area to the Station's roundhouse for approximately one-half to one hour once per week for fueling and/or maintenance when pier operations are being conducted. When there are no ongoing operations at the pier complex, this rail traffic occurs every other week.

Table 3-29 Common Sound Levels Measured in Decibels

Source (at a given distance)	Decibel (dB) Level	Typical Reaction
Civil Defense Air Siren (100 feet)	140 130	Pain
Jackhammer (50 feet)	120	Maximum Vocal Effort
Pile Driver (50 feet)	110	
Ambulance Siren (100 feet)	100	Very Annoying/ Discomfort
Motorcycle (25 feet) Power Lawnmower	90	
Garbage Disposal (3 feet) Alarm Clock	80	Intrusive
Vacuum Cleaner (3 feet)	70	
Normal Conversation (5 feet) Dishwasher	60	Normal Speech
Light Traffic (100 feet)	50	
Bird Calls (Distant)	40	Quiet
Soft whisper (5 feet)	30	
Human Breathing	20 10 0	Just Audible

Source: USACHPPM 2006

Route 34, which intersects a portion of the Station, and Route 18, which borders the Station to the north, are the primary sources of traffic noise in the vicinity of NWS Earle. The details concerning traffic volumes in and around NWS Earle are discussed in Section 3.5, Traffic. Although no noise data is available for the Laurelwood housing area, the housing area vicinity is typical of a rural residential area. There are limited sources of unusual noise levels (airports, public rail lines, major manufacturing, Interstate Highways, etc.) in the nearby community (U.S. Navy 2004a).

3.7.3 Construction Noise Transmitted Through Air

To characterize construction activity noise levels, this analysis uses data provided by the USEPA (USEPA 1971). Based on these USEPA criteria, construction noise resulting in an hourly equivalent sound level of 75 dBA at a sensitive receptor (e.g., hospital, residence, church) would represent a significant impact. Noise from construction activity varies with the types of equipment used and the duration of use (Figure 3-3). During operation, heavy equipment and other construction activities generate noise levels ranging typically from 70 to 90 dBA at a distance of 50 feet. Commonly, use of heavy equipment occurs sporadically throughout daytime hours.

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment (i.e., jackhammers, pile drivers). Table 3-30 shows the minimum distances at which noise from jackhammers and pile drivers could encroach on the indicated land use category.

Table 3-30 Construction Equipment Noise Impact Distances (feet)

Equipment	Distance to Residential Land Use	Distance to Commercial or Industrial Land Use
Jackhammer	56	18
Pile Driver, Impact	177	56

Source: California Nevada Super Speed Train Commission (CNSSTC) 2002
Note: Pile Drivers are not likely to be used for the proposed action but are included in this table to show impacts associated with the noisiest pieces of construction equipment.

Based on this, areas that could be impacted by dBA noise levels would encompass commercial/industrial sites within 18 feet of the noise source and to residential areas within 177 feet of the noise source. Using these criteria, the affected environment for land-based construction noise encompasses the area within a 177-foot radius of the areas of potential construction associated with providing unimpeded access to the Laurelwood housing area.

In addition to construction equipment noise, vibrations are also a source of community annoyance. Vibration consists of a shaking of the ground that can cause buildings to shake and rumblings to be heard inside structures. Many factors, such as the types of soils or rock underlying the equipment, influence the degree of vibration and the distance it travels. Vibration issues and annoyance tend to occur only with frequent (more than 70 per day) events at a location; infrequent events generally fail to result in perceptible levels. The distances at which annoyance from vibrations caused by common construction devices (CNSSTC 2002) occurs are presented in Table 3-31.

Figure 3-3 Common Construction Noise Levels

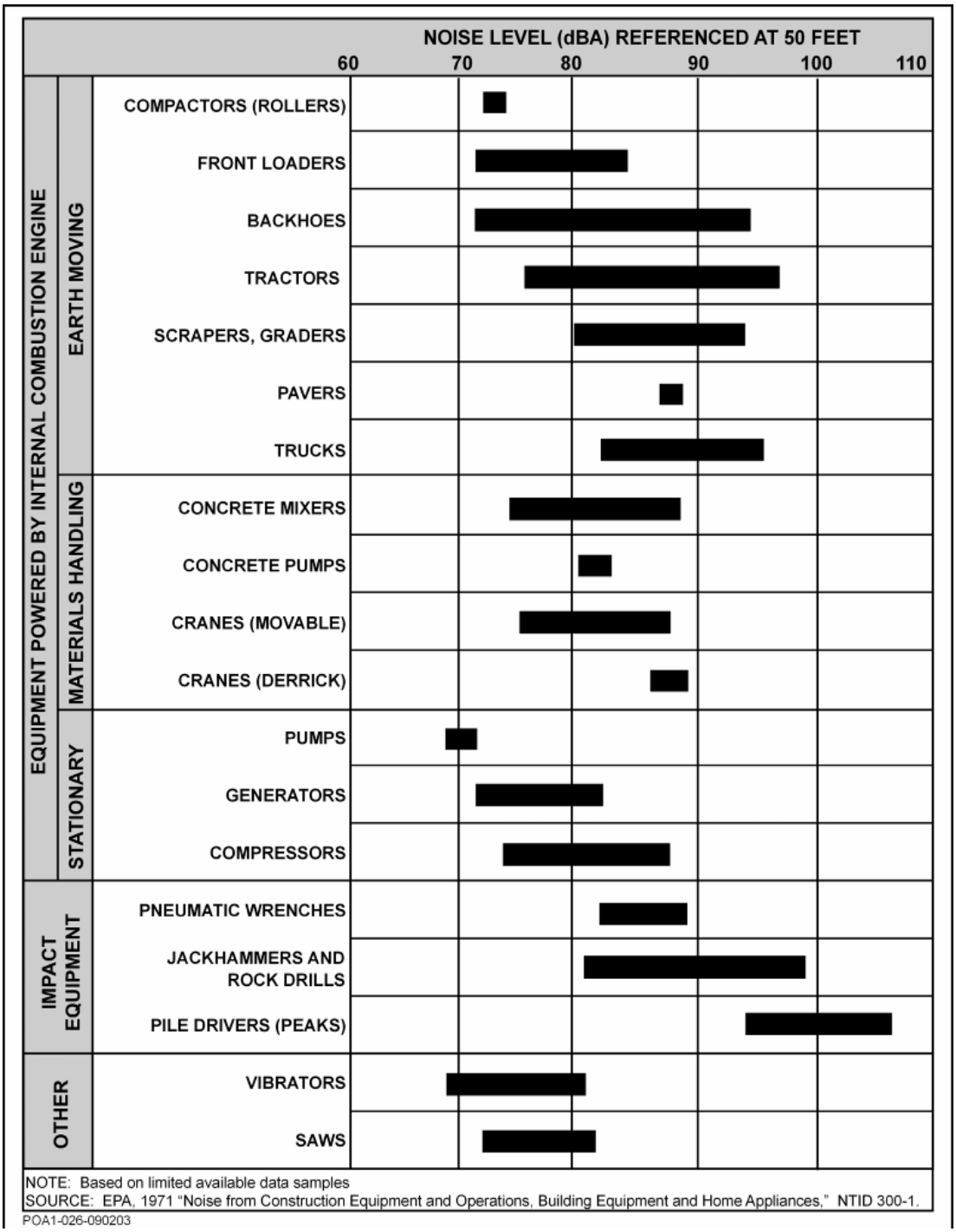


Table 3-31 Construction Equipment Vibration Impact Distances

Equipment	Distance to Human Annoyance (ft)
Pile Driver, Impact	Less than 525
Pile Driver, Vibratory	Less than 330
Vibratory Roller	Less than 265
Wheel Impactor	Less than 200
Large Bulldozer	Less than 85
Loaded Trucks	Less than 85
Caisson Drilling	Less than 85

Source: CNSSTC 2002

3.7.4 Traffic Noise

According to the U.S. Department of Transportation, Federal Highway Administration, the level of traffic noise depends on three things: 1) the volume of the traffic, 2) the speed of the traffic, and 3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires. The loudness of traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines will also increase traffic noise levels. In addition, there are other more complicated factors that affect the loudness of traffic noise. For example, as a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles. Traffic noise is not usually a serious problem for people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (U.S. Department of Transportation, Federal Highway Administration, 2007).

3.7.5 Noise Control in New Jersey

Several forms of regulations and policies concerning noise control measures exist at the federal, state, and local levels. The Federal Aviation Act (49 U.S.C. § 1471 et seq.), Noise Control Act of 1972 (42 U.S.C. § 4901 et seq.), and the Quiet Communities Act of 1978 (42 U.S.C. § 4901-4918) all provide some measure of federal noise control. The NJDEP promulgated noise regulations to control noise from stationary commercial and industrial sources in 1974. Within the noise regulations, there are established sound level standards of 50 decibels during nighttime (10:00 PM to 7:00 AM) and 65 decibels during daytime (NJDEP 2007a). The NJDEP does not have a noise control program and does not investigate noise complaints. The NJDEP has developed a state model noise ordinance, which municipalities may adopt or revise upon NJDEP approval. This ordinance restricts the use of construction and demolition activity, excluding emergency work, between the hours of 6:00 PM and 7:00 AM on weekdays, or between the hours of 6:00 PM and 9:00 AM on weekends and federal holidays, unless the activities can meet the limits set forth in the model noise ordinance.

Noise control is handled locally by one of the following:

- local health agencies certified by NJDEP pursuant to the County Environmental Health Act;
- municipal officials using a noise ordinance approved by NJDEP or using the state model noise ordinance;
- municipal officials using the public nuisance code.

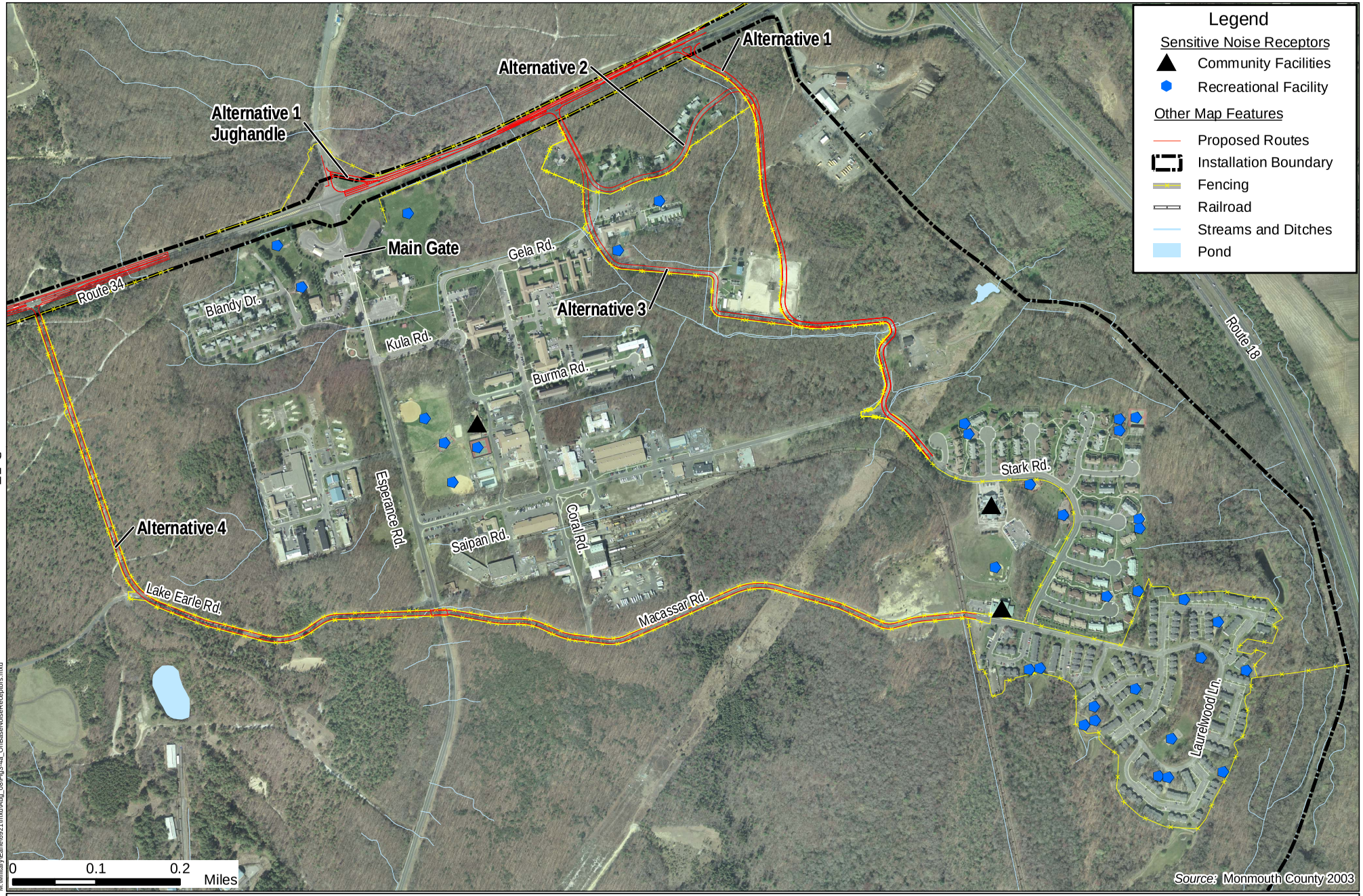
Monmouth County, in keeping with the intent of the County Environmental Health Act, has developed a Noise Control Program. Noise is managed by the Monmouth County Health Department and certified staff enforces the New Jersey noise regulations in accordance with N.J.S.A. 26:3A2-21 and the County Environmental Health Act (Monmouth County Health Department 2007).

The Colts Neck Township enforces three ordinances regarding noise control (Colts Neck Township 2007b). Two ordinances prohibit the use of sound-producing devices and creating unnecessary and disturbing noise in a manner that "shall annoy any person or persons or disturb the comfort, rest or repose of any person or persons being in his, her, or their place or places of abode" (Colts Neck Code, § 164-6 and § 164-7). The other is a set of noise standards promulgated under the township's Development Regulations (Colts Neck Code, § 102-66). The noise standards described under the Development Regulations are based on sound frequency and vibration frequency levels, between the hours of 7:30 PM and 7:30 AM.

3.7.6 Sensitive Noise Receptors

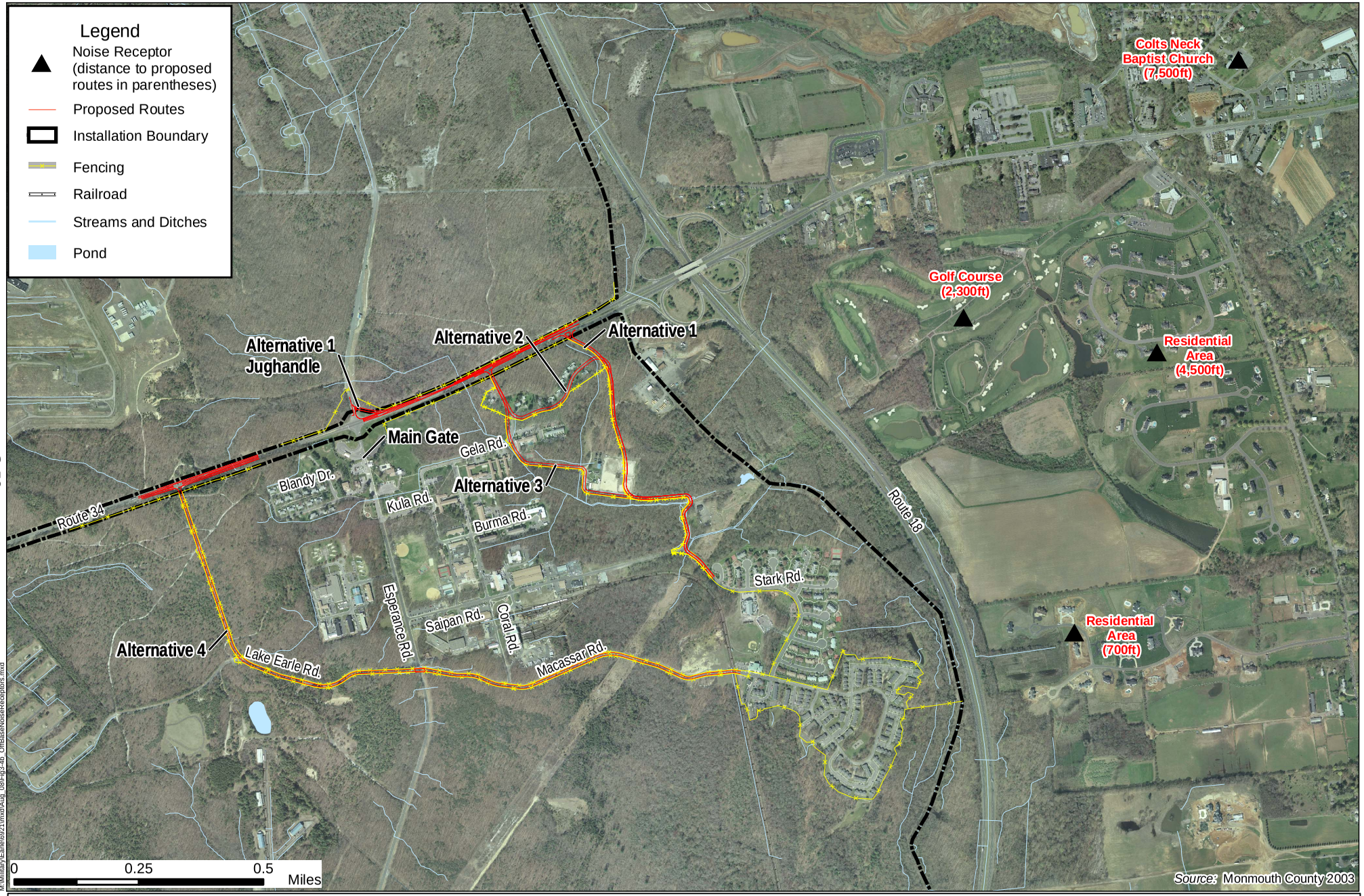
Sensitive noise receptors identified both on- and off-Station are shown in Figure 3-4a and Figure 3-4b in relation to the areas of potential road and fence construction.

Only a few off-Station noise receptors are located in the vicinity, including two residential areas, a golf course, and a church. The closest off-Station noise receptor is approximately 0.1 miles (700 feet) from the Laurelwood housing area. Naval Weapons Station Earle has several sensitive noise receptors in the vicinity of the proposed action area, including community facilities and recreational facilities. For the purpose of this section, community facilities include buildings where the NWS Earle community congregates and are potentially sensitive to noise, such as the Chapel, Child Development Center, and Family Recreation Center. Recreational facilities include playgrounds, courts (e.g., tennis or basketball), and ball fields.



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Figure 3-4a
On-Base Noise Receptors



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Figure 3-4b
Off-Base Noise Receptors

3.8 CULTURAL RESOURCES

Cultural resources are prehistoric or historic sites, buildings, structures, objects, or other physical evidence of human activity that are considered important to a culture or community for scientific, traditional, religious, or any other reasons. Section 106 (16 U.S.C. 470f) of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. §§ 470 et seq.), as amended, and as implemented by 36 CFR Part 800, requires federal agencies to consider the effects of their actions on historic properties before undertaking a project. A historic property is defined as any cultural resource that is included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The NRHP, administered by the National Park Service, is the official inventory of cultural resources that are significant in American history, prehistory, architecture, archaeology, engineering, and culture.

The State Historic Preservation Officer (SHPO) is responsible for reviewing projects involving federal action to assure their compliance with Section 106. The SHPO designates cultural resources as archaeological and architectural resources. Archaeological resources are sites where human activity measurably altered the earth or left deposits of physical remains. Sites may include evidence of cultures from prehistory (before European contact) and history (post-contact). The material cultural remains may consist of artifacts (e.g., fragments of tools, arrow points, ceramic vessels), features (e.g., remnants of foundations, hearths, midden), or other materials (e.g., ecological remains). Sites may contain both surface and subsurface elements. Underwater resources, such as submerged isolated artifacts (historic or prehistoric) and submerged shipwrecks, are designated archaeological resources.

Architectural resources are buildings, structures (bridges, canals, dams, ships), or objects (monuments, mileposts, statuary) of historical or architectural significance. Architectural resources many also include sites such as designed landscapes, cemeteries, trails, or ceremonial sites.

3.8.1 Research Methodology

The significance of a cultural resource is evaluated according to NRHP eligibility criteria (36 CFR Part 60.4). To qualify for listing in the NRHP, architectural resources generally must be at least 50 years old. However, more recent resources, such as Cold War era military buildings, may be considered eligible for the NRHP if they are of "exceptional importance." The significance of cultural resources is evaluated by applying one of four criteria. A property need only meet one criterion to be eligible for listing on the NRHP. These criteria are:

- Criteria A: Association with events that have made a significant contribution to the broad patterns of our history;
- Criteria B: Association with the lives of persons significant in our past;

- Criteria C: Embodiment of the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or;

- Criteria D: Have yielded, or may be likely to yield, information important in prehistory or history.

Cultural resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (i.e., its important physical features must be present and visible).

3.8.2 Assessment of Archaeological Sensitivity

Typically, predictive modeling in archaeology is used to identify both the areas that are likely to contain sites and those that are unlikely to contain sites; such modeling is based on the analysis of relevant environmental and cultural variables. A cultural resource assessment conducted by Ecology and Environment, Inc. (E&E) in 1990 applied this general principal to assess archaeological sensitivity at NWS Earle with one major modification: the extent of surface disturbance at the installation (A.D. Marble and Company 2007, U.S. Navy 1990). This disturbance is the result of major land-moving operations as a result of various Navy construction projects, which have impacted thousands of acres at the installation.

Surface disturbance operations at the installation took place in unconsolidated sandy soil that is prone to severe erosion. Any specific construction project on NWS Earle that resulted in removal of vegetation cover would automatically trigger surface erosion which affects an area larger than the project itself.

Relative severity of surface disturbance at any given location on the installation, either through direct impact or through subsequent erosion or corrective measures, is an important factor which determined preservation or destruction of archaeological sites.

Much of NWS Earle has been disturbed and those areas with the least disturbance are considered the mostly likely to contain intact archaeological resources (both prehistoric and historic).

The area of potential effect for cultural resources includes the areas likely to be affected by project activities. This area is defined as the four alternatives or routes between the Laurelwood housing area and Route 34. Based on the E&E cultural resource assessment, it was determined that most of this area was moderately sensitive for archaeological resources with only a few areas of either low or high potential for containing archaeological resources.

3.8.3 Cultural Context

In order to provide a regional context and to assess whether resources could be found in areas not previously surveyed, the prehistory and history of the region as well as cultural resources that are known to occur in the general area are discussed briefly.

3.8.3.1 Regional Prehistory

Prehistoric evolution in the Northeast is conventionally divided into broad periods: Paleoindian, Archaic/Transitional, Woodland, and Contact. The Archaic and Woodland periods are further divided into Early, Middle, and Late subperiods. A brief overview of each period is provided below.

Paleoindian Period (10,000 to 6,000 Before Christ [B.C.])

The Paleoindian period encompasses the earliest human habitation of New Jersey. Groups of Paleoindians were apparently established in the region prior to 9,000 B.C. Paleoindians are recognized archaeologically by distinctive fluted projectile points (Clovis and Folsum) that have been found throughout North America. Along with fluted projectile points, toolkits of the period include bifacial knives, drills, gravers, burins, flake cores, scrapers, and flake tools with no formalized shapes. Paleoindian subsistence strategies appear to have emphasized the hunting of large game animals, primarily elk and caribou, and Pleistocene megafauna, including mastodon, mammoth, and bison. Few traces of additional economic activities, such as the collection and processing of plant foods, have been detected (A.D. Marble and Company 2007).

Paleoindian settlement/subsistence patterns are thought to have consisted of seasonal migrations by small groups. Two of the most important Paleoindian sites in New Jersey are found within 10 miles of NWS Earle. The first is the Port Mobile site, which dates to between 10,000 and 8,000 B.C. and is located on a high terrace overlooking Arthur Kill on the western shore of Staten Island. The Turkey Swamp multi-component site is located 7 miles west of the mainside Area of NWS Earle. This site is on the headwater of Manasquan River, and lies in well-drained soils of the Klej series. Also, a complete jasper Clovis point was discovered within the southeastern portion of the installation (A.D. Marble and Company 2007).

Archaic Period (8,000 to 1,000 B.C.)

The warming Holocene climate resulted in environmental changes that encouraged population migrations and the development of new subsistence strategies. These developments characterize the Archaic period. In contrast to Paleoindian populations, Archaic populations manifested greater varieties of artifact types and cultural adaptation to new environments which allowed for population growth (Mounier 2003).

The initial phase of this period, the Early Archaic (8,000 to 6,000 B.C.), appears to represent an elaboration of earlier Paleoindian lifeways. The Early Archaic is traditionally divided from the Paleoindian period on the basis of distinctive projectile point types that include corner-notched,

stemmed, and bifurcated stemmed varieties. The primary difference in the tool assemblage from the Paleoindian period is the introduction of new projectile point forms.

Early Archaic groups were utilizing new habitats, although overall lifestyles apparently remained similar to those of Paleoindians. Early Archaic sites are often found in close proximity to major bodies of water. Occurrence of netsinkers and shell middens indicates a subsistence system that placed a significant emphasis on exploitation of estuarine and riverine resources. Diagnostic artifacts of this period include Hardaway, Kirk, and Palmer projectile point types. Site data suggest that Early Archaic populations lived in small, highly mobile groups. There are only 20 locations within Monmouth County that have yielded spot finds of Early Archaic artifacts. Two Early Archaic sites in New Jersey are the Rockelein Site and the Harry's Farm Site, which are located in the northwestern portion of the state in the Upper Delaware Valley (A.D. Marble and Company 2007).

During the Middle Archaic (6,000 to 4,000 B.C.), subsistence placed heavy emphasis on exploitation of animal and mast foods. This is reflected in more diverse tool kits, which included knives, points, pestles, pitted stones, mullers, and scrapers. During this period social groups increased in size, and sites became functionally diversified and tended to occupy microenvironments away from major water. Diagnostic artifacts of the Middle Archaic subperiod included bifurcate-base projectile points of LeCroy and Kanawha types. In Monmouth County these materials were found at sites in the Keyport area and Osborn Island in the Manasquan River Estuary (A.D. Marble and Company 2007).

In addition to diagnostic projectile points of this period, the toolkit includes hunting- and butchering-related objects similar to those of the preceding periods. Additions to the assemblages include atlatl weights, chipped-stone axes or celts, adzes for woodworking (possibly to build dugout canoes), and netsinkers (Mounier 2003).

The Late Archaic subperiod (4,000 to 1,000 B.C.) consisted of increased population density and decreased mobility. The sites of this period tend to be larger and more numerous. There are approximately 200 sites known in Monmouth County. In southern New Jersey the Late Archaic adaptation focused on exploitation of riverine, wetland, and coastal environments. In addition to year round hunting, Late Archaic populations made extensive use of seasonally available nutrients, which were provided by spring runs of anadromous fish (i.e., salmon, sturgeon, shad) and fall harvest of mast products (A.D. Marble and Company 2007).

The Late Archaic subperiod in New Jersey incorporated two major cultural influences, which represent intrusive traditions coming from the north and south. The southern influence known as the Piedmont Archaic Tradition is identified by diagnostic projectile points with long and narrow blades and stems (Poplar Island, Bear Island, and Lackawaxen Stemmed). These artifacts were manufactured from local lithic materials available either as cobbles or in outcrops. These materials include shale, argillite, quartzite, metasandstone, and rhyolite (A.D. Marble and Company 2007).

The northern influence, which is identified by the term "Laurentian," is encountered less often. Diagnostic artifacts of this tradition include Brewerton, Vosburg, and Genesee points (A.D. Marble and Company 2007).

Numerous Late Archaic sites are found in the proximity of NWS Earle. These include the Abature, Hope, and Field Cemetery sites located approximately one mile east of the mainside area; the Turkey Swamp Site, and Sites 28MO60, 28MO70, 28MO71, and 28MO72 located on the Manasquan River (A.D. Marble and Company 2007).

During the Transitional Period, patterns of prehistoric cultural behavior were similar to those in the Archaic, although the exploitation of aquatic resources, particularly anadromous fish, intensified. In New Jersey, the Transitional adaptation found its best-known expression in the Susquehanna tradition. It is characterized by broad-bladed points of Perkiomen, Lehigh, Koens-Crispin, and Susquehanna types. Some of these bifacial tools were used as knives for fish processing rather than spear points. An important innovation during the Transitional Period was the manufacture of steatite (soapstone) vessels, which were used in conjunction with headed stones for cooking and oil rendering. Steatite was often procured from prehistoric quarries along the Susquehanna Valley and widely traded in the Northeast (A.D. Marble and Company 2007).

In New Jersey, during the Late Archaic/Transitional Period, a mortuary cult known as the Koens-Crispin Complex appeared. This complex emphasized cremation burials and the bestowal of lavish grave goods in the form of bannerstones (atlatl weights), celts, broad-bladed bifaces, fossils, and other exotic artifacts. This complex seems to have been located in Burlington County although similar remains have been found in Monmouth County (Mounier 2003).

Toward the end of the Transitional Period soapstone vessels were replaced by ceramic replicas. Marcey Creek Plain and Ware Plain ceramic types of this period were found near Keyport in an unknown context, on the Turkey Swamp Site and on the Wordell site on the Manasquan River, located approximately eight miles southwest of the mainside area of NWS Earle (A.D. Marble and Company 2007).

Woodland Period (circa [ca.] 1,000 B.C. to Anno Domini [A.D.] 1610)

The Early Woodland subperiod dates between ca. 1,000 and 300 B.C. in the Middle Atlantic region. By 1,000 B.C., regional climates and environments approximated historic/modern conditions. The productive deciduous element of plant environments would have remained intact from earlier periods. Early Woodland adaptations to this environment are generally thought to represent a continuation of preceding Late Archaic patterns. The introduction of ceramic technology, however, represented an important technological development. Additional changes included the replacement of broad projectile point forms with new point types.

Diagnostic projectile point types for this period include Meadowood side-notched and unnotched, Adena, and Fishtail points. The earliest pottery associated with this period includes Marcey Creek and Ware Plain types. These ceramics consist of flat-bottomed, straight-sided

vessels with lugs or handles. These types were apparently followed by conical-based (cone-like) vessels tempered with coarse grit, coil-constructed, and cord-marked on both interior and exterior surfaces. Ceramic forms of the period also include tobacco pipes (Mounier 2003).

Early Woodland populations appear to have used uplands and low-order stream environments more frequently than did their Archaic predecessors. In addition, major Woodland habitation sites located in the floodplains of rivers show a degree of permanence or sedentism not evident during the Archaic.

The greater degree of sedentism during the Early Woodland has been attributed to several factors, including increased efficiency among Early Woodland populations in exploiting a variety of localized resources through settlement selection and resource scheduling and the development of social institutions that encouraged or compelled the generation of food surpluses. Finally, environments, along with associated sets of food resources, became stabilized. The introduction of pottery also contributed to greater sedentism by facilitating the ability of Early Woodland populations to store food for periods of low environmental productivity.

Middle Woodland cultures (ca. 400 B.C. to A.D. 1000) show a basic continuity of lifestyles with their Late Archaic and Early Woodland predecessors. Continuities include overlaps of site locations and the types of activities performed in various locations. Ceramic studies suggest, however, that the exploitative territories of some groups were more restricted during the Middle Woodland than in earlier times. In the absence of significant environmental and technological change, the limiting of territorial boundaries is viewed as a result of growing populations and elaborations of social relationships and organization.

Diagnostic artifacts of the Middle Woodland subperiod include Rossville, Lagoon, Fox Creek, and Jack's Reef points, along with several ceramic styles that include net-impressed and zoned-incised types. During this period, argillite appears to have been the preferred raw material for chipped-stone tools. Other artifacts commonly associated with this time period include pestles, hammerstones, and anvil stones, which indicate the collection and processing of plant foods. The continued exploitation of fish is indicated by the presence of netsinkers. The most common biface form is known as the Fox Creek point. The association of Fox Creek points and net-impressed pottery, which is well documented in New Jersey at the falls of the Delaware near Trenton, is referred to as the Fox Creek culture. This expression is sometimes referred to as the Abbott phase, named for the prevalence of related artifacts at the Abbott Farm site (Mounier 2003). The Kessler Farm site located on the Manasquan River near the project area shows evidence of the Early/Middle Woodland subperiods (A.D. Marble and Company 2007).

The Late Woodland subperiod (ca. A.D. 1000 to 1610) is distinguished, in some areas, by increased residential stability, typified by large permanent or semi-permanent villages and subsistence systems that utilized horticultural products. The Late Woodland populations are thought to have comprised a number of relatively small bands made up of related families. This cultural evolution could be attributed to the emergence of maize cultivation around 1,000 A.D. These settlements tend to cluster along the coast and along the trunks of major rivers. Although

the stream basins above tidewater were occupied, sites in the headwaters are less numerous in the Late Woodland subperiod than in former times (Mounier 2003).

Late Woodland toolkits reflect the same functional diversity as earlier assemblages. Hallmarks of the period include small triangular bifacial tools and weapons, and a variety of chipped- and pecked-stone and groundstone tools. Ceramic types include collared and collarless vessels decorated with incised geometric motifs and cord-marking that sometimes covers half to three-quarters of the body. Hoes, used in horticultural activities, are included in some assemblages of the subperiod (Mounier 2003).

Prior to the European colonization in New Jersey in the 17th century, the native populations of the state were not culturally homogenous. The northern portion of the state, including the Sandy Hook Bay, the mouth of the Raritan River, and the Chapel Hill Area, was inhabited by the Munsee speaking Lenni-Lenape people. The southern portion of the state, including the Main Area of the station, was populated by Unami speaking groups. During the course of the 17th and 19th centuries, the native population of the area was gradually displaced by European colonization, and either assimilated or migrated into Canada and Upper New York State (A.D. Marble and Company 2007).

3.8.3.2 Regional History

Europeans began coming to the New Jersey coast at the end of the 15th century. Within three decades the territory of the present Monmouth County was visited by John Cabot (1497), Giovanni de Verrazano (1524), and Estevan Gomez (1525), who claimed the area for England, France, and Spain, respectively. However, none of these early explorers were able to secure their claims by an effective military or economic presence (A.D. Marble and Company 2007).

Colonization of New Jersey began in 1609 with Henry Hudson's discovery of Sandy Hook, the Atlantic Highlands, and the Hudson River. Hudson was an Englishman but because he undertook his voyage on behalf of the Dutch East India Company, Holland claimed title to a large area around Manhattan Island. In 1664, the Dutch yielded the territory between the Hudson River and the Delaware River to the British. However, in 1663 a group of Englishmen, aware of the impending advent of British rule, sailed from Long Island, and began negotiating the sale of land by the Indians that lived along the Navesink and Shrewsbury Rivers (A.D. Marble and Company 2007).

At this time, the area was an important focal point in the settlement system of the Unami clan of the Lenni-Lenape nation. It was inhabited by at least three known Unami groups who participated in the sale of the property to the British. These include the Navesinks north of the Navesink River, the Navarumsunks between the Navesink and Shrewsbury Rivers, and the Portapecks between the Shrewsbury and Shark Rivers (A.D. Marble and Company 2007).

Historical sources also indicate that the study area contained the crossroad of four important Native American trade and exchange routes, which led into Monmouth County from the north,

northwest, west, and southwest. These Indian trails were the Achkinkeshacky (Hackensack) Trail from the headwaters of the Hudson River; the Minisink Trail from the region embracing the Great Lakes; the Raritan-Lopotcong Trail from the west; and the Crossweeksung Trail from the southwest. All of these terminated at the Navesink River. The Crossweeksung Trail entered the State at Trenton and eventually passed through Freehold to the Yellow Brook at Colts Neck. Two paths branched off at this point. The upper one passed through Tinton Falls to Red Bank. The Southern path led from Colts Neck through the Indian Field at the head of Shark River and then to Manasquan (A.D. Marble and Company 2007).

Monmouth County was established in 1683 and included the Township of Shrewsbury (founded in 1693). In its original form, the Township encompassed all of the land presently occupied by the mainside area of NWS Earle. In the course of the 18th, 19th, and 20th centuries, Shrewsbury Township underwent numerous subdivisions, resulting in 11 new administrative units. One of these was the Atlantic Township (now called Colts Neck).

During the 18th and 19th centuries, farming was very prevalent as well as the mining and sale of marl. Marl is a potash-rich mineral substance that was mined for use as a fertilizer and in brickmaking. One of the largest and most extensively mined marl deposits is found within the mainside area of NWS Earle, along Mingamahone Brook (A.D. Marble and Company 2007).

In the middle of the 19th century an Englishman named Brocklebank established a brick kiln in the southwest portion of the Main Area (A.D. Marble and Company 2007). It was during this time period that Monmouth County began to develop a railroad service. By 1873 a branch of the New Jersey Southern Railroad passed near the project area and connected to the primary urban centers in Matawan, Keyport, Red Bank, Manasquan, Farmingdale, and Squan (A.D. Marble and Company 2007).

During the first half of the twentieth century the level of development remained low. The underdevelopment and sparse settlement in this part of the county was the major reason the area was selected for the construction of NWS Earle.

3.8.3.3 History of NWS Earle

Naval Ammunition Depot (NAD) Earle was named in honor of Rear Admiral Ralph Earle, chief of the Bureau of Ordnance during World War I. The main administrative area was located near the intersection of U.S. Route 34 and Asbury Avenue. The most significant addition to the construction plan was the facilities for handling Army ammunition. In an agreement between the War Department and the Department of the Navy, the establishment of NAD Earle became a joint venture. The Army contributed over $19.5 million for the expansion and improvement of the depot and waterfront areas in 1944 and the Navy built and operated the entire station. NAD Earle was commissioned on December 13, 1943 although construction was far from complete.

During World War II, 230 magazines, 70 explosive-containing railroad barricades, and numerous officer quarters, barracks, administrative, and support buildings were built at the mainside area.

The construction at Chapel Hill consisted of railroad barricades, truck yards, administrative quarters, barracks, and the installation of utility lines. The construction on the rail line and paved road in the northern portion of Chapel Hill destroyed a large prehistoric site, which existed at the headwaters of Ware Creek (A.D. Marble and Company 2007).

NAD Earle's primary mission during World War II was as a point of embarkation for ordnance destined for the European battlefronts. The installation remained in active operation in the postwar decades. Until 1950, the mission of the NAD Earle was primarily to receive, sort, store, and issue ordnance, and secondarily to repair and assemble ordnance. However, in 1950 the mission expanded to include the activities of the Naval Ordnance Materials Handling Laboratory (NOMHL), which was transferred to the installation from Hingham, Massachusetts. When NOMHL moved to NAD Earle, Building R-4B in the Waterfront Area was converted from a barracks into office and laboratory space. NOMHL was renamed the Naval Packaging, Handling Storage and Transportation Laboratory and has occupied Building C-54 on the Main Station since 1988 (A.D. Marble and Company 2007).

As the Navy entered the Cold War era, the station's mission was expanded again to accommodate the storage of missiles. In 1959, NAD Earle was assigned the functions of a limited storage site for special weapons. Also during the 1950s, the workload at Earle increased slightly due to the gradual deactivation of the naval ammunition depots at Fort Mifflin, Pennsylvania, and Hingham, Massachusetts (A.D. Marble and Company 2007).

Naval Ammunition Depot Earle was renamed NWS Earle as part of a department-wide reorganization in 1974. Toward the end of the 1980s, the Navy began a major expansion program which included a fourth pier and 500 additional housing units to support several homeported ships (A.D. Marble and Company 2007). The installation's mission also expanded to serve as the homeport for the United States Ship (USS) Nitro in the late 1980's. The ship was decommissioned in 1996 and had an approximate population of 331. By the late 1980s, two additional ammunition ships from Service Squadron Two, the USS Suribachi and the USS Butte, were also homeported at NWS Earle. The USS Suribachi, with an approximate population of 344, and USS Butte, with an approximate population of 388, were decommissioned in 1994 and 1996, respectively. The USS Detroit was homeported at NWS Earle in 1990. The ship was decommissioned in 2005 and had an approximate population of 636. The USS Supply was homeported at NWS Earle in 1994 with an approximate population of 667. In 2001 the ship became USNS Supply and reduced its population to 24. The USS Arctic was homeported at NWS Earle in 1995 and had an approximate population of 666. In 2005 the ship became USNS Arctic and reduced its population to 24. The USS Seattle was homeported at NWS Earle in 1990 and transferred to Norfolk, Virginia in 2001. The ship had an approximate population of 726.

Naval Weapons Station Earle has not handled Army ammunition since the 1960s. The Navy continues to use the barricaded railroad sidings in the old Army Intransit Area and still transports weapons and ordnance to the piers by rail, but most of the materials entering the station from the outside today arrive via tractor trailer (A.D. Marble and Company 2007).

3.8.4 Cultural Resources at NWS Earle

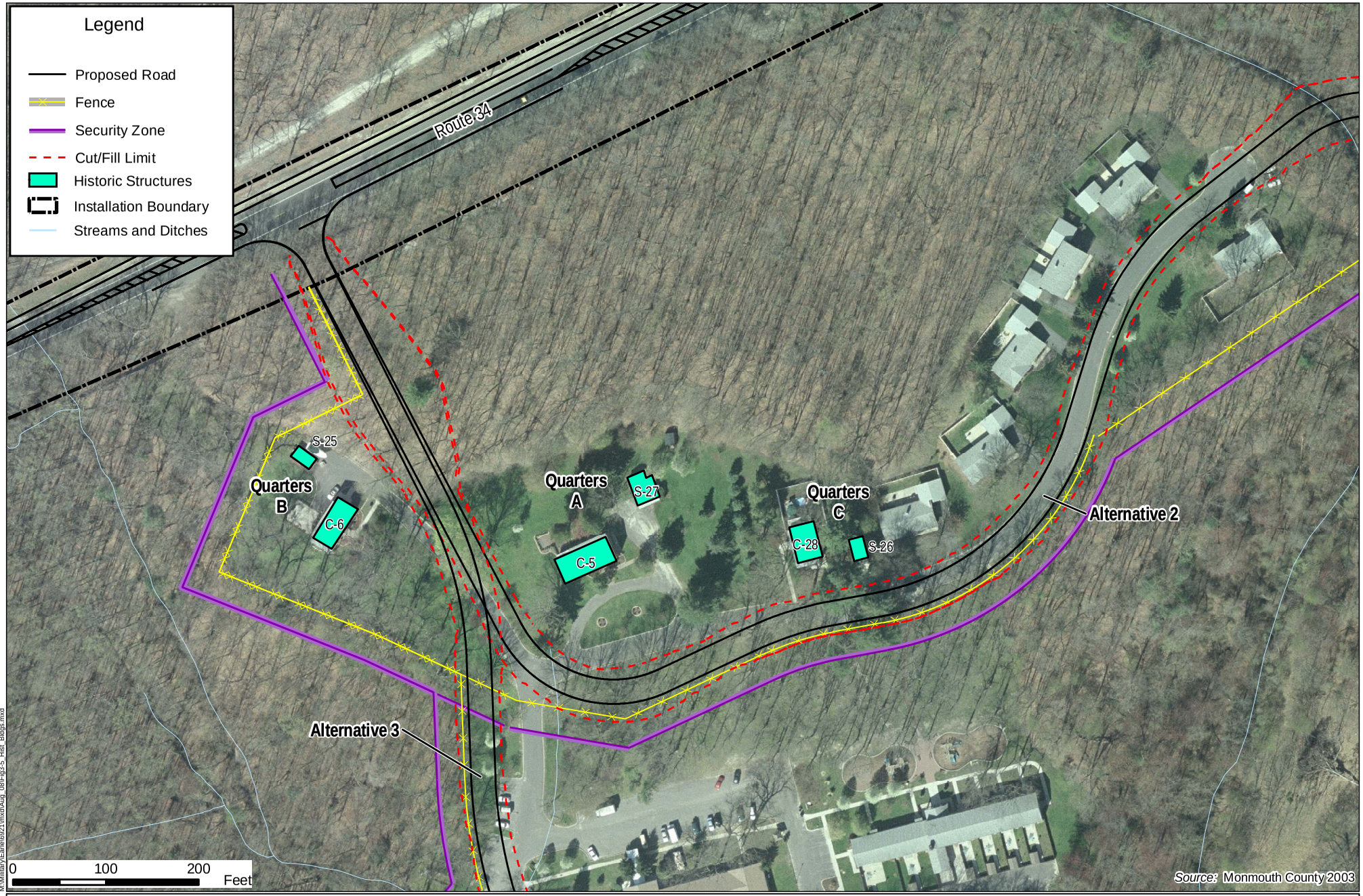
Naval Weapons Station Earle currently manages cultural resources in accordance with its Historical and Archaeological Resource Protection Plan (HARP). In a letter dated 05 June 2007, the Navy notified SHPO that contractual arrangements have been made for the preparation of an Integrated Cultural Resources Management Plan (ICRMP) once agreement is reached on National Register eligibility of resources. The ICRMP will identify appropriate treatment of historic properties at the installation and will replace the HARP.

There have been a number of historic structures/groupings recorded within the installation that are recommended eligible for listing on the NRHP. These structures include the Classification Yard, the Barricaded Railroad Sidings (Buildings A-1 to A-10 and B-1 to B-10), the Locomotive shops (Buildings C-19 and R-9), the E Group Storehouses (Buildings E-1 and E-12), the Transfer Depot (Building HA-1), Magazines I-1 to I-24 and J-1 to J-24, the Dymaxion Deployment Units (Buildings 5N, 6E, 8K(1), 8K(2), 11G, S-472, and DDU adjacent to Building GB-1), the Naval PHST Inert Storage Building (Building GB-1), the Ammunition Reworking Facilities (Buildings E-13 and E-14), a Locomotive Repair Shop (Building C-50), and the Mine/Depth Charge Reworking Facility (Building MA-3). One submerged archaeological site, the M/V Alexander Hamilton shipwreck located near Pier 1 in Sandy Hook Bay, is listed on the NRHP (A.D. Marble and Company 2007). Quarters A and its associated garage, Quarters B and its associated garage, and Quarters C and its associated garage are eligible for listing on the NRHP (see Appendix D).

Of the structures/groupings described above, only Quarters A, B, C and their associated garages are in the vicinity of any of the proposed alternative alignments (specifically Alternative Alignments 2 and 3) (Figure 3-5). These units, built in 1943, have retained their initial use as officer housing. To determine the presence or absence of archaeological resources, archaeological investigations were conducted within proposed road alignments. Results of these investigations are discussed in more detail at the end of this section. The Navy completed consultation with the SHPO regarding the eligibility for NRHP listing of identified sites (see Appendix D).

3.8.4.1 Previous Surveys

Ecology & Environment (E&E) conducted a cultural resource assessment for NWS Earle in 1990. The results of their survey indicated that six buildings (Quarters D, E, F, G, H, and S-108, which are buildings that pre-dated Earle and which Earle continues to utilize) and more than 800 buildings and structures constructed between 1943 and the present were not eligible for nomination to the NRHP. Their assessment also concluded that the alteration of the surficial deposits on the installation had a severe impact on previously existing prehistoric sites.



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Figure 3-5
Historic Structures

By using predictive modeling, E&E identified the areas where prehistoric archaeological sites likely survive. Aerial photography, soil survey maps, and archaeological surface reconnaissance were used to assess the archaeological sensitivity of NWS Earle. In all, E&E identified 13 locations in the mainside area and 6 locations in the Chapel Hill Area that had high potential for containing undisturbed prehistoric sites (U.S. Navy 1990). These areas are not in the vicinity of the proposed alternative alignments.

Another architectural survey of the installation was conducted by Louis Berger and Associates, Inc. (LBA) in 1996. Their study concluded that NWS Earle did not demonstrate qualities of significance with respect to design or construction that would support NRHP eligibility as a historic district. However, they did identify 12 structures that met NRHP eligibility under Criterion A because of their association with the principal mission during World War II. They also determined that two notable wartime building types were eligible to the NRHP under Criterion C (LBA 1999).

A.D. Marble and Company conducted a cultural resources survey on the installation in 2005. The historic architectural investigation included field survey, evaluation of resources for inclusion on the NRHP, written and graphic documentation of identified resources, and a photographic inventory of all permanent properties on the facility. The archaeological investigation consisted of review and reproduction of a previous archaeological survey report prepared for NWS Earle. This report was intended to serve as a consolidated summary of three investigations (LBA 1996-1999, E&E 1989-1990, and A.D. Marble and Company 2005-2006). It was this study that determined that the architectural resources mentioned previously were potentially eligible to the NRHP (A.D. Marble and Company 2007). The archaeological survey report was presented to the SHPO and consultation regarding eligibility of architectural resources is still on-going.

In October 2007 TEC Inc. conducted a Phase I archaeological survey of the four alternatives associated with the proposed Laurelwood housing access project (U.S. Navy 2007f). The investigation revealed disturbed soils in the developed portions of the installation and largely undisturbed soils in the wooded, undeveloped portions. Fill, asphalt, and angular gravels were observed in the developed portions of the installation. During the survey three areas with archaeological material were encountered. Cultural materials included a lithic flake, lithic flakes associated with shell, a cluster of historic debris, and a potentially *in situ* brick. Additional Phase II testing was conducted at these three locations in February 2008 (U.S. Navy 2008c). The area proposed for a jughandle U-turn associated with Alternative 1 was also subjected to both Phase I and Phase II testing.

During the 2008 fieldwork, shovel test pits and test units were excavated either to determine if artifacts recovered represented archaeological sites or to better define site boundaries. Test units also assisted in making NRHP-eligibility determinations. Nine relevant sites/features or isolated artifacts were encountered during the course of the 2008 fieldwork. As a result of these surveys only one site was identified as potentially eligible for NRHP listing. In accordance with requirements of the Archaeological Resources Protection Act, references to the location of this

site are not provided. Pursuant to the requirements of Section 106 of the NHPA, the Navy submitted the findings of the October 2007 and February 2008 surveys and testing to the SHPO, initiating consultation on the proposed action. In a letter dated January 23, 2009, the SHPO stated "concur with this finding of no adverse effect to historic properties." Appendix D contains the correspondence between the Navy and the SHPO.

3.9 GEOLOGY, TOPOGRAPHY, AND SOILS

3.9.1 Geology

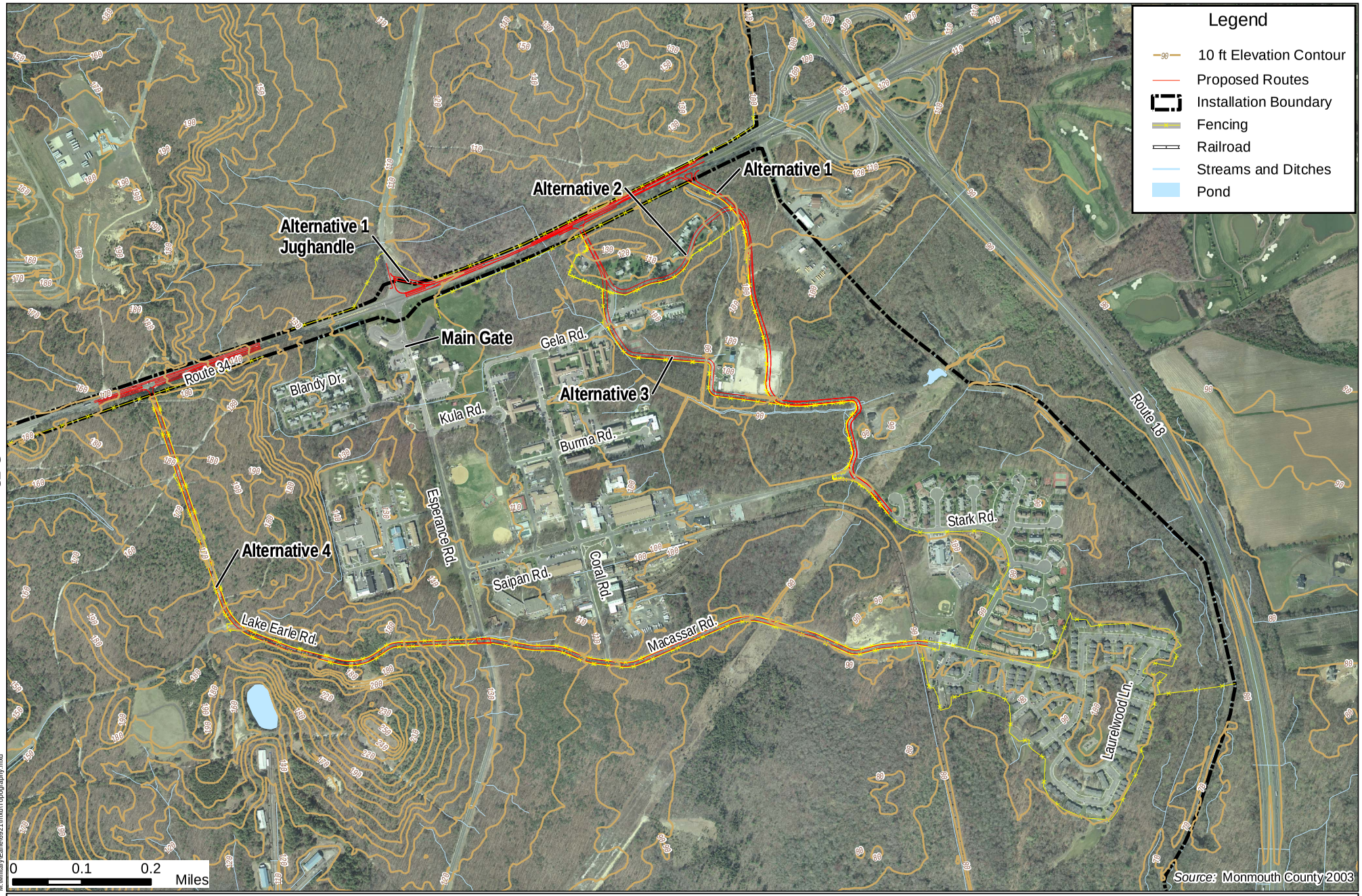
All of NWS Earle lies within the Outer Coastal Plain physiographic region of New Jersey. This region is made of sedimentary deposits dating from the Tertiary period with overlying deposits of sand and gravel. Unconsolidated clays, silts, sands, and gravels mark the lower elevations of the Coastal Plain region. It also has a high quartz sand content, thus creating lower fertility and low water-holding capacity (U.S. Navy 2001). The depth to the bedrock is greater than 700 feet below the ground surface.

3.9.2 Topography

Naval Weapons Station Earle consists of gently rolling hills intersected with meadows and low-lying wetlands. Elevations at mainside range from 80 to 300 feet above mean sea level (MSL) (Figure 3-6). In the project area, elevations range from approximately 80 feet to 180 feet MSL. Alternative Alignment 4 would run by the western side of Cranberry Hill, the highest part of the Hominy Hills system. Most of the project area is very flat at an elevation of approximately 100 feet above MSL. Elevations start climbing south of Esperance Road at the Hominy Hills (U.S. Navy 2001).

3.9.3 Soils

The soils at the installation are grouped into five soil associations: Lakewood-Lakehurst-Evesboro-Klej, Atsion, Tinton-Collington-Colts Neck, Freehold-Urban Land-Holmdel, and Freehold-Urban Land-Collington. Soils in the project area that are poorly or somewhat poorly drained include Atsion sand, Klej loamy sand, Manahawkin muck and Shrewsbury sandy loam. Most of these soils are found in the northern section of the project area stretching from the Green Drive residential area to the Stark Road and Laurelwood residential areas. Moderately well to excessively drained soils exist as well. These soils include Evesboro sand, Lakehurst sand and Lakewood sand. Udorthents (fill) also exist north and south of Esperance Road from the Main Gate east to Macassar Road and in more highly developed areas. The areas containing this type of soil tend to be graded and lack large slope changes. Details of these soils can be found in Table 3-32. The soils of the project area are shown in Figure 3-7.



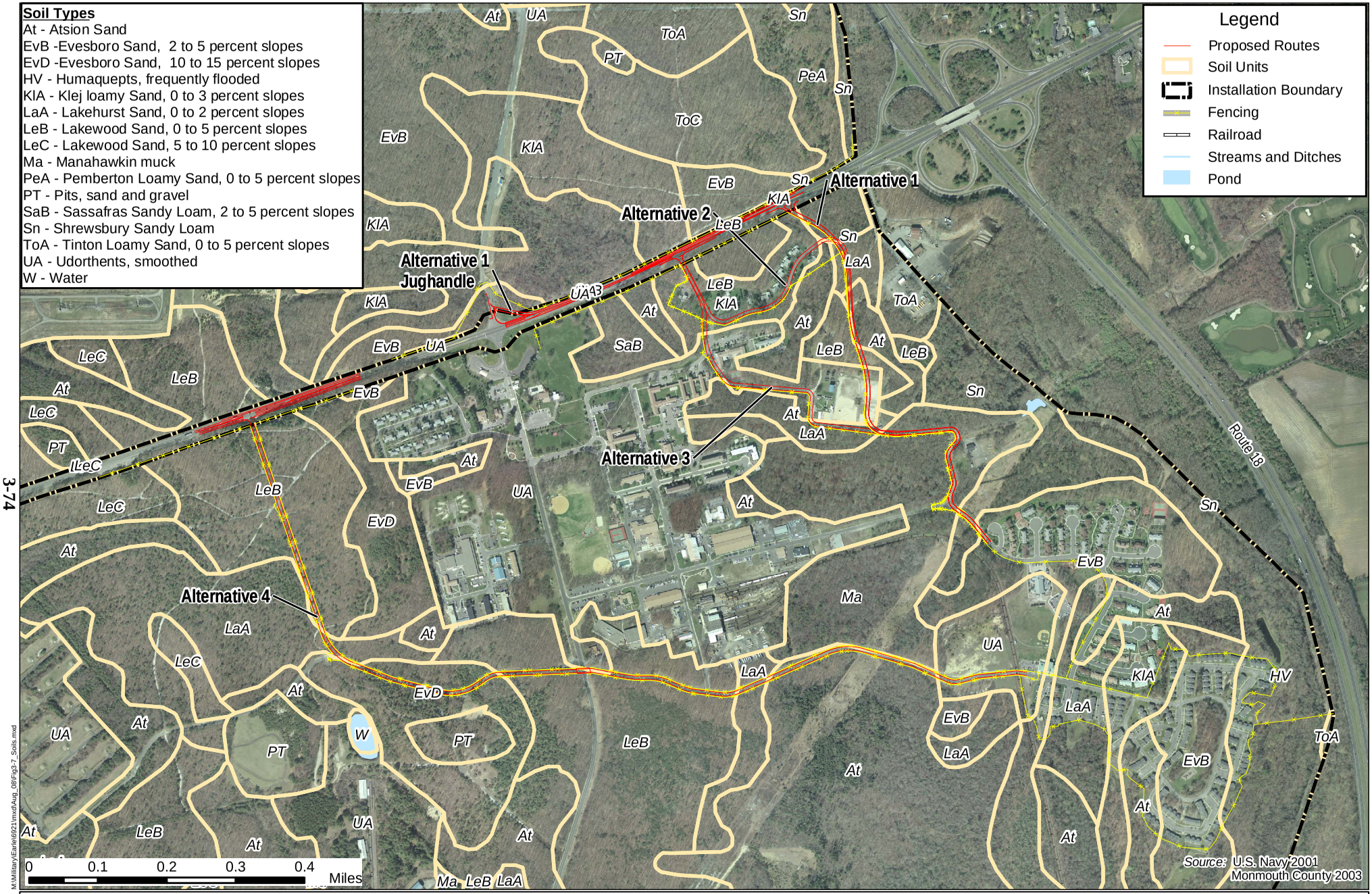
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Figure 3-6
Topography at
Mainside, NWS Earle

Table 3-32 Soil Series Descriptions

Atsion soils are poorly drained soils found on upland flats. Slopes of this series range from 0 to 2 percent. Permeability of this series is moderately rapid or rapid in the subsoil and rapid in the substratum. Available water capacity is low; runoff is very slow. There is only a slight erosion hazard with this series. The organic content is moderate, but unlimed areas are extremely to very strongly acid. The majority of this series is wooded; however, it is well suited for specialty crops such as blueberries. The major limitation for conventional crops is the seasonally high water table. This series is poorly suited to commercial woodland production.
Evesboro series soils are excessively drained soils found on uplands. Slopes of this series range from 0 to 25 percent. Permeability of this series is rapid in the subsoil and substratum. Available water capacity is low; runoff is very slow to rapid, depending on slope. There is a slight water erosion hazard; however, there is a severe hazard for wind erosion. This soil is poorly suited to field crops, pasture, and commercial woodland production. The main limitation to field crops is low available water capacity, low organic matter, and rapid permeability.
Humaquepts are somewhat poorly drained to very poorly drained soils found in floodplains. Slopes in this series range from 0 to 2 percent. Permeability of this series is moderate to moderately rapid in the subsoil and substratum. Available water capacity is high; runoff is slow. Organic matter is low to high, depending on site location. Unlimed areas are extremely to slightly acid. This series is poorly suited to farming due to the seasonally high water table and frequency of flooding. In broader floodplains, this series is suited to pasture, but grazing should be restricted during periods of high water.
Keyport soils, found on uplands, are moderately well drained. Slopes of this series range from 0 to 15 percent. In some areas, this series contains pyritic clay in the substratum. When pyritic clay is exposed during excavation and used as topsoil, it becomes extremely acidic (pH between 2.5 to 3.0) and will not support vegetation. These clays are mostly found near Keyport, Hazlet, Marlboro, Manalapan, and Aberdeen townships. Permeability of this series is slow in both the subsoil and substratum. Available water capacity is high; runoff is slow to very rapid depending on slope. There is only a slight erosion hazard. Organic matter is moderate, but unlimed areas are extremely to very strongly acid. The soil is well suited to pastures and commercial woodland production. The soil is suited for field crops but is limited by the seasonally high water table.
Klej series soils are moderately well-drained to somewhat poorly drained soils found on uplands. Slopes of this series range from 0 to 5 percent. In areas near the townships of Hazlet, Marlboro, and Aberdeen there are small areas when soils of this series contain pyritic clay in the substratum. Permeability of this series is rapid in the subsoil and moderate in the substratum. Available water capacity is low; runoff is very slow. There is only a slight erosion hazard created by water, but there is a moderate wind erosion hazard. This series is poorly suited to field crops, pasture, and commercial woodland production. The main limitations are the low available water capacity, the seasonally high water table, and rapid permeability.
Lakehurst series soils are moderately well-drained to somewhat poorly drained soils found on uplands. Slopes of this series range from 0 to 2 percent. Permeability of this series is rapid in the subsoil and substratum. Available water capacity is low; runoff is very slow. There is only a slight erosion hazard from water but a severe erosion hazard from wind. Organic matter is low; unlimed areas are extremely to strongly acid. These soils are poorly suited to field crops, pasture, and commercial woodland production. The main limitations are low available water capacity, low organic matter, rapid permeability, and seasonally high water table.
Lakewood soils, found on uplands, are excessively drained. Slopes of this series range from 0 to 10 percent. Permeability of this series is rapid in the subsoil and moderate in the substratum. Available water capacity is low; runoff is very slow to slow depending on slope. There is only a slight erosion hazard from water, but there is a severe erosion hazard from wind. Organic matter is low; unlimed areas are extremely to very strongly acid. This series is poorly suited to field crops, pasture, and commercial woodland production. The main limiting factors are low available water capacity, low organic matter, and rapid permeability.
Manahawkin muck soils are very poorly drained soils found in lowlands and back swamps. Slopes of this series range from 0 to 2 percent. Permeability of this series is moderately slow to moderately rapid in the subsoil and moderately rapid in the substratum. Available water capacity is high; runoff is very slow with common ponding. Soils of this series experience frequent flooding. There is only a slight erosion hazard. Organic matter is high, but unlimed areas are extremely to strongly acid. This series can be used for specialized crops such as cranberries and blueberries, if properly managed. However, the soil is poorly suited for commercial woodland production.
Sassafras series soils are well-drained soils found on uplands. Slopes of this series range from 0 to 25 percent. Permeability of this series is moderate in the subsoil and moderately rapid in the substratum. Available water capacity is high; runoff is medium. There is a slight erosion hazard. Organic matter is moderate; unlimed areas are strongly to extremely acid. This series is well suited to field crops, pastures, and commercial woodland production.
Shrewsbury soils, found on upland flats, are poorly drained. This series has a glauconite content of 10 percent or less, with slopes ranging from 0 to 2 percent. Permeability of this series is moderately slow or moderate in the subsoil and moderately rapid or rapid in the substratum. Available water capacity is high; runoff is slow, with ponding water at times. There is only a slight erosion hazard. Organic matter is moderate; unlimed areas are extremely or very strongly acid. This soil is suited for field crops, pasture, and commercial woodland production. The main limitation is the seasonally high water table.
Tinton series soils are well-drained soils found on uplands and terraces. This series has a glauconite content ranging from 10 to 40 percent with slopes between 0 to 25 percent. Permeability of this series is moderately rapid in the subsoil and moderate or moderately rapid in the substratum. Available water capacity is moderate; runoff is slow to very rapid, depending on slope. There is only a slight erosion hazard from water but a moderate erosion hazard from wind. Unlimed areas are extremely to very strongly acid. This series is suited to field crops, pasture, and commercial woodland production.
Udorthents are well-drained to somewhat poorly drained soils lacking horizonation. This series is formed in stratified or graded, sandy or loamy fill material containing as much as 35 percent gravel. Slopes of this series range from 0 to 3 percent. This series consists of areas that have been altered by excavation or filling.

Source: U.S. Navy 2001



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Figure 3-7
Soils at
Mainside, NWS Earle

Acid forming soils have been recorded in Monmouth County typically in the northern area. These soils contain pyrite, which when exposed to air forms sulfuric acid (U.S. Navy 1987). Exposure of these soils makes it nearly impossible to re-establish vegetation and can lead to erosion and acidification of surface waters. Klej loamy sand, which is found in the area where Alternative Alignments 1, 2, and 3 would enter off of Route 34, is one of the types of soil that can become acidic. However, this area has been previously disturbed by the development of the Green Drive housing area and no problems have been encountered.

3.10 BIOLOGICAL RESOURCES

Biological resources include vegetation, wildlife, wildlife habitat, and threatened, endangered and other sensitive species. The ROI for biological resources is the terrestrial environment potentially traversed by the alternative alignments. This area is generally bound by the installation boundary to the north, Route 34 to the west, Lake Earle Road to the southeast and Macassar Road to the east. Areas north and south of Tarawa Road to the west of Route 34 (across from the main gate) are also included in the ROI. A habitat evaluation and preliminary endangered, threatened and rare species survey was performed for the Navy along the four alternative alignments in August, September and October, 2007 (U.S. Navy 2007e). A presence or absence survey for target endangered, threatened and rare species at NWS Earle was completed on October 15, 2008 (U.S. Navy 2008d).

3.10.1 Vegetation

Land cover in the ROI includes both undeveloped and developed or previously disturbed areas. Undeveloped areas are mainly forested (including forested wetlands). Developed or previously disturbed areas consist of roads, housing complexes, power line and railroad rights-of-way, administrative buildings, a wastewater treatment plant, mowed lawns and fields.

The major vegetation communities of NWS Earle mainside are the South Jersey Pine Barrens, South Jersey Uplands, and South Jersey Freshwater Wetlands. General plant communities were identified in the Integrated Natural Resources Management Plan (INRMP) 2001-2010 for NWS Earle (U.S. Navy 2001). The general plant communities are shown in Figure 3-8. Forested areas are composed of mixed hardwoods, hardwoods and pine, oak and pine, and mixed oak communities. The ROI is dominated by the Pine Barrens ecosystem, but is not part of the National Pinelands Reserve (Figure 3-9). The Reserve encompasses one million acres located on the coastal plain to the south of NWS Earle from Ocean County to Cape May County (McCormick 1963 in U.S. Navy 2001). The power line right-of-way is generally composed of grassland and shrubland. Vegetation communities are a key indicator of the type and quality of habitat. Dominant plants identified in the 2007 habitat evaluation are described below for the proposed rights-of-way of each of the alternative alignments.

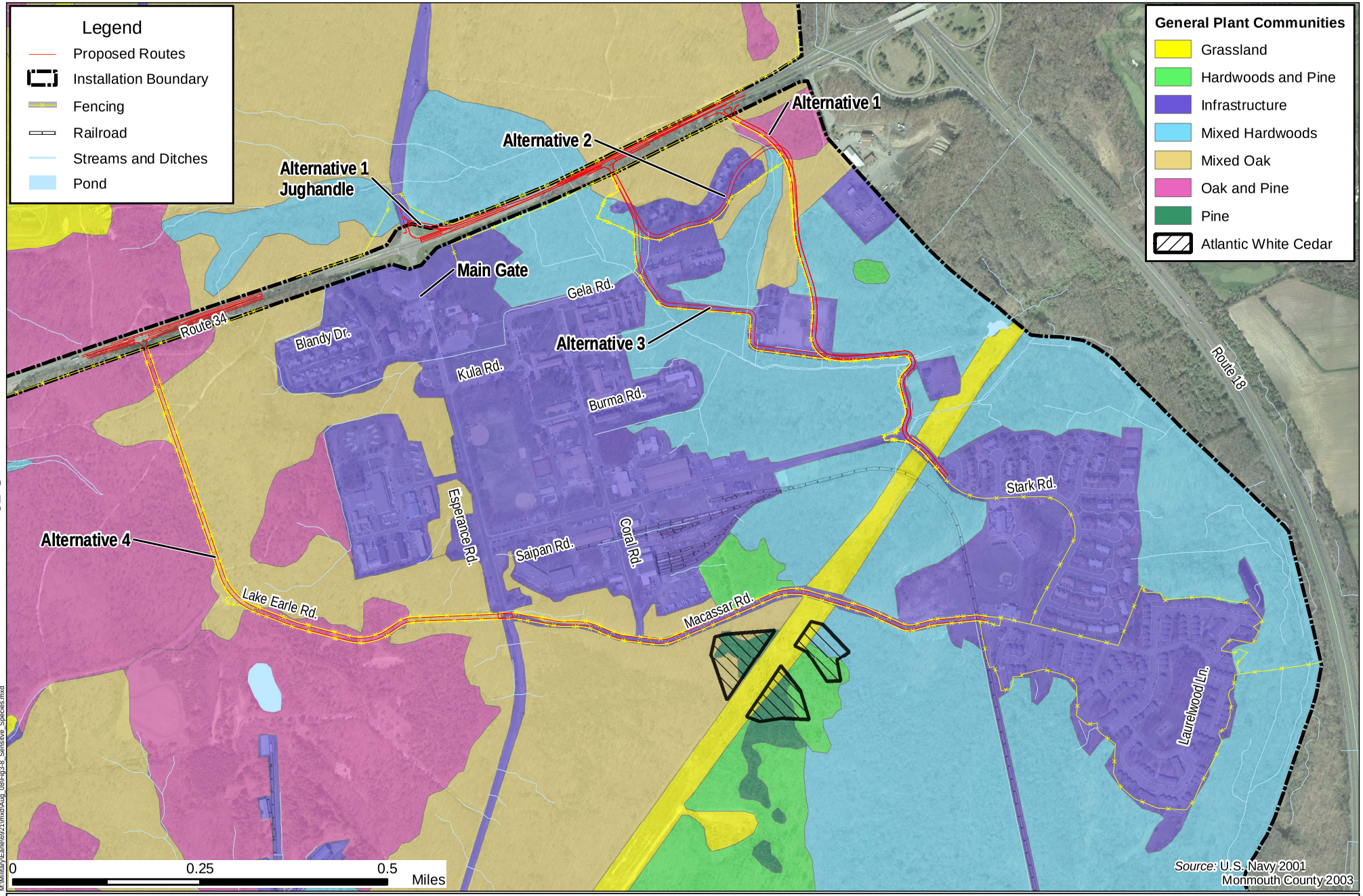
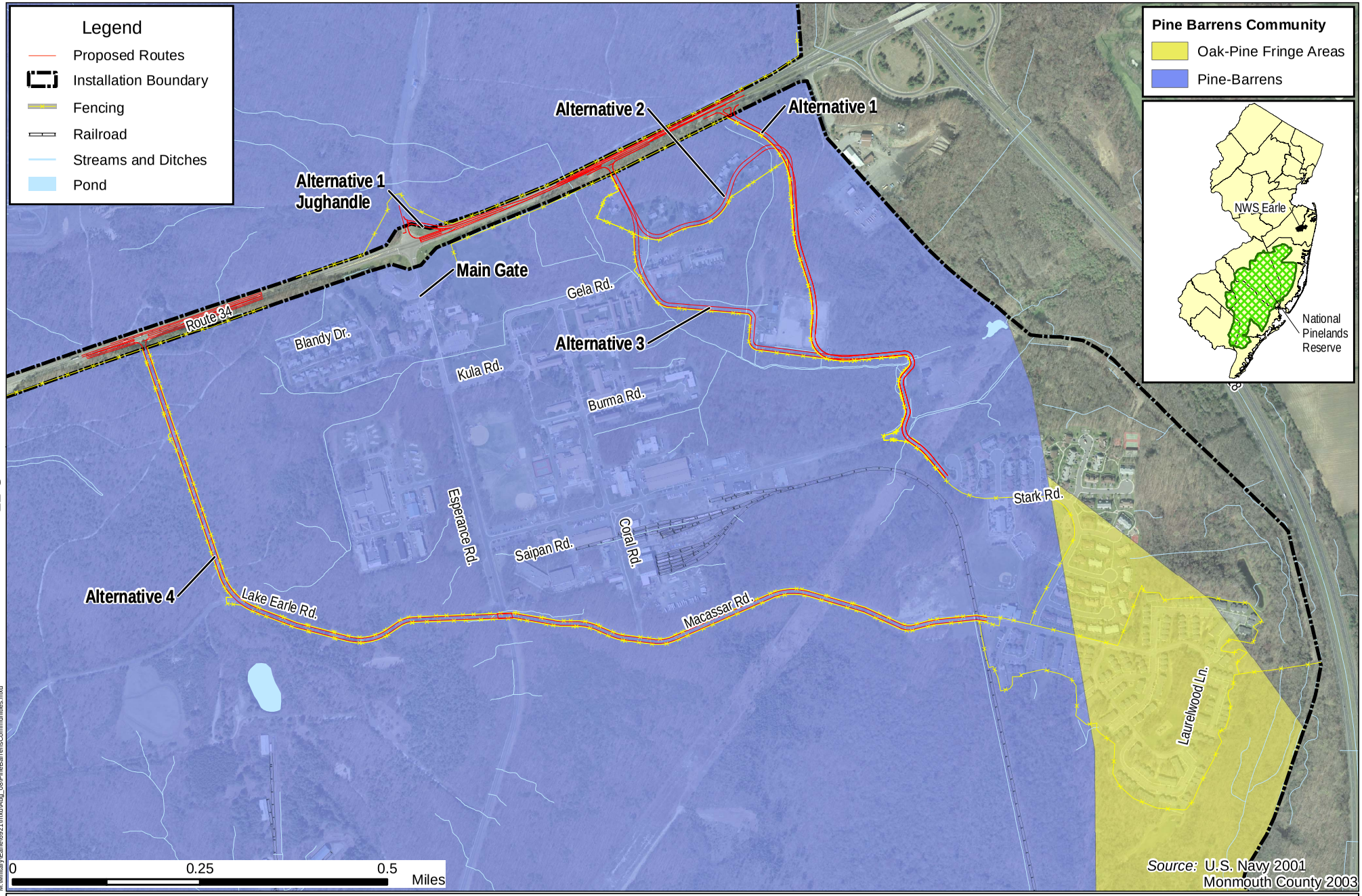


Figure 3-8
General Plant Communities



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Figure 3-9
Pine Barren Communities

Alternative Alignment 1

Alternative Alignment 1 traverses a red maple (*Acer rubrum*)/sweet gum (*Liquidambar styraciflua*) forest along a channelized stream corridor behind the Green Drive Housing complex. In addition to the dominant species, other trees observed include gray birch (*Betula populifolia*), chestnut oak (*Quercus prinus*), white oak (*Q. alba*), black gum (*Nyssa sylvatica*), and pitch pine (*Pinus rigida*). Because of the closed canopied nature of the overstory trees, the understory vegetation is relatively sparse. The ground cover consists mainly of dead leaves and woody debris with the exception of scattered patches of the non-native and invasive Japanese stilt grass (*Microstegium vimineum*).

Shrub species observed, particularly along the stream corridor, include sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*) and non-native and invasive Japanese barberry (*Berberis thunbergii*). Round-leaved greenbrier is also present.

Alignment 1 intersects with an existing sand road at the end of Green Drive. The alignment continues east following the sand road, and traverses an upland deciduous forest. The alignment then crosses a mowed field associated with a wastewater treatment plant and connects with an existing asphalt road. Tree species in the upland forest consist of white oak, sassafras (*Sassafras albidum*), sweet gum, American beech (*Fagus grandifolia*), pitch pine, black oak (*Q. Velutina*), mulberry (*Morus spp.*) and persimmon (*Diospyros virginiana*). Highbush blueberry, dangleberry (*Gaylussacia frondosa*), and Virginia creeper (*Parthenocissus quinquefolia*) are present in the understory. The alignment then turns to the north on the existing road through a closed canopied forested wetland. A channelized stream (Hockhockson Brook) parallels the road to the south. The road then makes a sharp turn to the east over a small one-lane bridge over Hockhockson Brook, continues through a forested section, then intersects with Saipan Road, turns northeast, crosses a power line right-of-way, then enters the Stark Road Housing complex. A railroad right-of way crosses the power line right-of-way to the east. The dominant trees in the forested wetland consist of red maple, sweet gum, and American holly (*Ilex opaca*). Although this area provides suitable habitat for the state-listed rare cranefly orchid (*Tipulario discolor*), which are often found in forested wetlands with American Holly, no specimens were identified during surveys (see Section 3.10.3). The sparse shrub layer consists of scattered individual highbush blueberry bushes. The ground cover consists of patches of Japanese stilt grass and sphagnum moss (*Sphagnum spp.*). Several specimens of what are tentatively believed to be the state-listed rare basket oak (*Quercus michauxii*) were found in the vicinity of Alternative Alignment 1, 2, and 3 on the northern side of the one-lane bridge at Hockhockson Brook (U.S. Navy 2008d) (see Section 3.10.3). In addition, surveys identified the state-listed imperiled southern twayblade (*Listera australis*) adjacent to one of the potential basket oaks (U.S. Navy 2008d). The nearest potential basket oak and southern twayblade are located approximately 120 feet from the limits of disturbance associated with the proposed action.

Dominant plant species observed in the power line right-of-way include highbush blueberry, common reed (*Phragmites australis*), steeplebush (*Spiraea tomentosa*), cotton grass

(*Eriophorum virginicum*), hay scented fern (*Dennstaedtia punctilobula*), New York fern (*Thelypteris noveboracensis*), broom sedge (*Andropogon virginicus var. abbreviatus*), New York aster (*Symphotrichum novi-belgii*) and sphagnum moss (*Sphagnum spp.*). Autumn olive (*Elaeagnus umbellata*), lespedeza (*Lespedeza spp*.), and goldenrod (*Solidago spp*.) were observed along the roadside edge. Because of the open-canopied nature of the power line right-of-way, the area provides good habitat for a diversity of grassland plant species.

Alternative Alignment 2

Alternative Alignment 2 cuts through a mowed lawn adjacent to one residence and upland forest located on a ridge before connecting with Gela Road. The alignment would follow Gela Road until it intersects with Green Drive. The road turns north, then northwest following Green Drive through the Green Drive Housing complex, and then connects with an existing unpaved road at the end of the cul-de-sac. The proposed alignment then follows the same route as described for Alignment 1.

A few planted non-native and native trees such as blue spruce (*Picea pungens*), white pine (*Pinus strobus*), black oak, pitch pine, American beech are scattered throughout the lawn. The dominant species in the upland forest consist mainly of chestnut oak (*Quercus prinus*) and black oak, with white oak (*Q. alba*) and a few sassafras and American beech. The understory consists of patches of dangleberry among dense leaf litter. Large patches of Pennsylvania sedge (*Carex pensylvanica*) are also present on the forest floor. A mesic (moist, well drained) forest is adjacent to the mowed lawn and behind the residence to the south. A small channelized stream runs east to west. Historically, this may have been a forested wetland associated with Hockhockson Swamp; however, the channelization of the stream may have drained the wetland. Tree species in this forest include sweet gum, American beech, black oak, white oak, American holly, and black cherry (*Prunus serotina*).

Alternative Alignment 3

The proposed entrance for Alternative Alignment 3 would be the same as proposed for Alternative Alignment 2 and follows the same route connecting with Gela Road in the Green Drive Housing Complex (see description for Alignment 2). The route would then follow Gela Road through the intersection of Green Drive going east then turning north (around Building C-4) along an existing road through a mesic forest to the wastewater treatment plant. The road then makes a sharp turn to the east then turns north around the wastewater treatment plant. The road then follows the same proposed route as Alignments 1 and 2. A channelized stream is located to the south and runs parallel to the roadway. The dominant trees in the forest consist of red maple and sweet gum, with American holly (*Ilex opaca*) also present. The sparse shrub layer consists of scattered individual highbush blueberry bushes. The ground cover consists of patches of Japanese stilt grass and sphagnum moss. Disturbance loving species such as Japanese barberry, tree-of-heaven (*Ailanthus altissima*), Japanese stilt grass, *Lespedeeza*, multiflora rose (*Rosa multiflora*), white mulberry (*Morus alba*), poison ivy (*Toxicodendron radicans*), black cherry and persimmon are common to abundant along the existing roadside edges.

Alternative Alignment 4

Alternative Alignment 4 would cut through an oak/pine forest, connect with an existing sand road going east and then traverse an oak/pine forest before intersecting with Lake Earle Road. The route would then turn north following Lake Earle Road through oak/pine and pine/oak upland forest before it intersects with Esperance Road. The section of Alternative Alignment 4 between Route 34 and Esperance Road is upland habitat typical of the Pine Barrens of southern New Jersey.

The tree species in the oak/pine forest between Route 34 and Lake Earle Road consist mainly of chestnut oak and pitch pine with scattered sassafras trees (*Sassafras albidum*). The thick understory consists mainly of dangleberry and scattered patches of bracken fern (*Pteridum aquilinum*). Mountain laurel (*Kalmia latifolia*) and glaucus greenbrier (*Smilax glauca*) are also present. This area is designated a prescribed burn area in the INRMP. Controlled burns reduce the fuel load, and corresponding potential for intense fires, and encourage natural regeneration of pitch pine (U.S. Navy 2001). Pitch pine is an important community of the Pine Barrens. Along the edges of the sand road, there are patches of lowbush blueberry (*V. pallidum*), staggerbush (*Lyonia mariana*), sheep laurel (*K. angustifolia*), little blue stem (*Schizachyrium scoparium*), and golden heather (*Hudsonia ericoides*). These areas are typical Pine Barrens habitat with no sign of recent disturbance, and the roadside edges are suitable habitat for Pinelands-listed and state-listed sickle-leaf golden-aster (*Pityopsis* [*chyopsis*] *falcata*), pineland or stiff tick-trefoil (*Desmodium strictum*), and state-listed racemed milkwort (*Polygala polygama*). None of these species were identified during surveys (see Section 3.10.3).

The area along Lake Earle Road between the intersections of the sand road with Lake Earle Road and Lake Earle Road with Esperance Road is completely forested with a mixture of oak/pine and pine/oak. A small borrow pit (dry) and an open sandy area (archery range) are located along the east side of the road approximately 1,000 feet south of the intersection of Lake Earle Road and Esperance Road. To the east a sand ridge dominated by pitch pine rises about 40 feet above the roadway. This ridge may be the remnant of a coastal dune.

The dominant tree species along Lake Earle Road consist mainly of pitch pine and chestnut oak with the understory consisting mainly of dangleberry and low bush blueberry. Near the intersection of Lake Earle Road and Esperance Road signs of previous disturbance to the landscape were observed, particularly on the south side of Lake Earle Road where several specimens of the non-native tree-of-heaven are present. Red maple was also observed, along with fetterbush (*Eubotrys racemosa*), sweet pepperbush, staggerbush, and deer-tongue grass (*Panicum clandestinum*).

After crossing Esperance Road, Alignment 4 intersects Macassar Road and continues north on the existing road until it enters the Laurelwood Housing complex. An asphalt jogging trail is located on the west side of Macassar Road running parallel to the roadway. Between the intersection of Esperance and Macassar Roads and the Laurelwood Housing complex, Macassar Road traverses a variety of habitats. The majority of these are forested with the exception of the

power line right-of-way and a previously disturbed successional field near the entrance to Laurelwood. Between the intersection of Esperance and Macassar Roads and approximately 500 feet south of the power line right-of-way, the area consists of an oak dominated upland forest consisting of white oak, black oak, and chestnut oak. Sassafras is also present although it is not as common as the oaks. The understory consists mainly of dangleberry, with occasional mountain laurel scattered throughout.

A large forested wetland associated with Hockhockson swamp exists in the vicinity of the power line right-of-way. The forested areas in the vicinity of Macassar Road are dominated by stands of mature red maple and black gum. White, black and chestnut oak, sassafras and American holly were observed in the drier areas and margins of the wetland. Stands of Atlantic white cedar (*Chamaecyparis thyoides*) were observed along the edges of the power line right-of-way. These and adjacent stands are recognized as habitats of special concern in the INRMP as they may harbor protected species. The understory of the forested wetland consists of dangleberry, highbush blueberry, sweet pepperbush and mountain laurel. Bog fern (*Thelypteris simulata*) and skunk cabbage (*Symplocarpus foetidus*) were observed throughout the wetland.

An open canopied wetland exists along the power line right-of-way. This was created by the construction and continued maintenance of the power line right-of-way. Initially, this area in the vicinity of Macassar Road was once part of the large forested wetland that exists on both sides of the right-of-way. Dominant plant species observed include highbush blueberry, *Phragmites,* steeplebush, cotton grass, broom sedge, and sweet pepperbush. One of the target rare plant species, the state endangered New Jersey rush (*Juncus caesariensis*), was confirmed in the power line right-of-way, east of Macassar Road (see Section 3.10.3). This specimen was located approximately 100 feet from the limits of disturbance associated with the proposed action. In addition, a specimen of southern twayblade and Swamp Pink (*Helonius bullata*), were identified near the stands of Atlantic white cedar to the east of Macassar Road (Figure 3-8). The Swamp Pink is a federally-listed threatened, state-endangered plant. The location of four other state-listed plant species already known to NWS Earle where re-confirmed [Knieskern's beaked rush (*Rynchospora knieskernii*), Pale beaked rush (*Rynchospora pallida*), Pine Barrens reed grass (*Calamovilifa brevipilis*), and Barrett's sedge (*Carex barratti*)]. Each of these known species are at least 450 feet from the limits of disturbance associated with the proposed action.

A field is present in a disturbed area on the western side of Macassar Road near the entrance to the Laurelwood housing area. This area is an Installation Restoration Program (IRP) site known as Site 1 (Operable Unit 8) (see Section 3.12.2.1). The field is dominated by various grass species including switch grass (*Panicum virgatum*), little blue stem and broom sedge (*Andropogon virginicus*). Saplings and young pitch pine, black oak and red cedar are present, but sparse throughout the field. Lespedeza (*Lespedeza sp*.) was also observed growing among patches of switch grass along the woodland edge.

3.10.2 Wildlife

The Pine Barrens of NWS Earle support habitat with characteristics (e.g. geology, soils, topography, biota) similar to that of the Pinelands National Reserve to the south. Wildlife species identified within the Pinelands National Reserve include 299 species of birds, 39 species of mammals, 91 species of fish, 33 species of reptiles, and 26 species of amphibians (U.S. Navy 2001). Many of the pinelands species may be found at NWS Earle.

A variety of birds has been observed at NWS Earle. Common bird species have been documented through the 1988 rare species survey (NJDEP 1988) and the Audubon bird summary survey report (Sutherland 1995). A complete list of birds that have been identified in Monmouth County is presented in Appendix E.

Avifauna that may be found in upland forests at NWS Earle mainside include the rufous-sided towhee (*Pipilo erythrophthalmus*), pine warbler (*Dendroica pinus*), tufted titmouse (*Baeolophus bicolor*), brown thrasher (*Toxostoma rufum*), mourning dove, red-eyed vireo (*Vireo olivaceus*), turkey vulture (*Cathartes aura*), wild turkey (*Meleagris gallopavo*), ruffed grouse (*Bonasa umbellus*), whip-poor-will (*Caprimulgus vociferus*), northern flicker (*Colaptes auratus*), eastern wood pewee (*Contopus virens*), eastern phoebe (*Sayornis phoebe*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), black-capped chickadee (*Poecile atricapillus*), wood thrush (*Hyiocichla mustelina*), yellow-rumped warbler (*Dendroica coronata*), scarlet tanager (*Piranga olivacea*), northern cardinal (*Cardinalis cardinalis*), northern oriole (*Icterus galbula galbula*), house finch (*Carpodacus mexicanus*), and ovenbird (*Seiurus aurocapillus*) (Sutherland 1995 In U.S. Navy 2001). Upland forest habitat is found along all of the alternative alignments and is the most dominant habitat along Alternative Alignment 4.

Common birds typical of the low-lying areas, including forested wetlands found along all of the alternative alignments, are the northern parula warbler (*Parula americana*), American redstart (*Setophaga ruticilla*), common yellowthroat (*Geothlypis trichas*), catbird (*Dumetella carolinensis*), eastern screech owl (*Otus asio*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*Picoides pubescens*), and white-eyed vireo (*Vireo griseus*) (Sutherland 1995 in U.S. Navy 2001). The mesic and wetland forest areas and forest areas with larger trees along all of the alternative alignments may provide suitable nesting and foraging habitat for owls and hawks, including barred owl (*Strix varia*), Cooper's hawk (*Accipiter cooperii*), and red-shouldered hawk (*Buteo lineatus*).

Grassland bird species that may occur along the power line, fields, and mowed areas include purple martin (*Progne subis*), eastern meadowlark (*Sturnella magna*), northern bobwhite (*Colinus virginianus*), red-tailed hawk (*Buteo jamaicensis*), European starling (*Sturnus vulgaris*), white-throated sparrow (*Zonotrichia albicollis*), American kestrel (*Falco sparverius*), mourning dove (*Zenaida macroura*), prairie warbler (*Dendroica discolor*), killdeer (*Charadrius vociferus*), American goldfinch (*Carduelis tristis*), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), and song sparrow (*Melospiza melodia*) (Sutherland 1995 in U.S. Navy 2001). All of the alternative alignments cross the power line.

The complex landscape heterogeneity provides a multitude of habitats for the wildlife at NWS Earle. A list of the fauna that occurs in Monmouth County is presented in Appendix E. Common mammals that are likely to be present in forest communities traversed by all of the alternative alignments include white-tailed deer (*Odocoileus virginianus*), white-footed mouse (*Peromyscus leucopus*), pine vole (*Microtus pinetorum*), eastern gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*), red fox (*Vulpes vulpes*), common gray fox (*Urocyon cinereoargenteus*), eastern chipmunk (*Tamius striatus*), masked shrew (*Sorex cinereus*), least shrew (*Cryptotis parva*), long-tailed weasel (*Mustela frenata*), and eastern mole (*Scalopus aquaticus*) (U.S. Navy 2001). Grassy fields and disturbed areas, such as those of the power line, are likely to support eastern cottontail (*Sylvilagus floridanus*), white-footed mouse, meadow vole (*Microtus pennsylvanicus*), and meadow jumping mouse (*Zapus hudsonius*).

Surveys of game populations on NWS Earle were conducted in 1993. White-tailed deer were found to be common, numbering approximately 700 to 800 individuals (NWS Earle 1993 in U.S. Navy 2001).

Fifty-nine species of herpetofauna (33 species of reptiles and 26 species of amphibians) could potentially occur within the pinelands of NWS Earle mainside. A list of the herpetofauna that occurs in Monmouth County is presented in Appendix E. Potential habitat was observed within the ROI for the state endangered corn snake (*Elaphe g. guttata*) and state threatened northern pine snake (*Pituophis m. melanoleucus*) in the Pine Barrens habitat along Alternative Alignment 4. The structure of the habitat, upland sandy pitch pine/oak forests with a healthy understory, is reminiscent of habitat for these species in the Pine Barrens (Refer to Section 3.10.1), however they have not been found to be present within the ROI based on presence or absence surveys that targeted those species (U.S. Navy 2008d). Potential breeding habitat for state threatened Pine Barrens treefrog was observed in the power line right-of-way near Alternative Alignment 4 along Macassar Road. The presence of this species has been confirmed during field surveys (Refer to Section 3.10.3) in the power line right-of-way.

Tributaries of Hockhockson Brook originate within or to the east of the ROI and have an intermittent water flow. Downstream reaches of the brook that are north of NWS Earle mainside, where the flow is more perennial, support tessellated darter, pumpkinseed and American eel (U.S. Navy 2001). The entire length of Hockhockson Brook is classified Freshwater 2, Trout-Maintenance and Category Two (FW2-TM (C2)) by the state of New Jersey, indicating that it has waters suitable for stocking of trout. The New Jersey Division of Fish and Wildlife (NJDFW) stocks Hockhockson Brook downstream of the borders of NWS Earle mainside (U.S. Navy 2001).

3.10.3 Threatened, Endangered and Other Sensitive Species

Federally threatened and endangered species are those listed for protection under the federal Endangered Species Act (16 U.S.C. §§ 1531 et seq.), administered by the U.S. Fish and Wildlife Service (USFWS). State threatened and endangered species are protected by the New Jersey

Endangered Species Conservation Act (N.J.S.A. 23:2A-1 -15), administered by the NJDEP NJDFW. Other species of concern include those ranked as imperiled (S1 or S2) or rare (S3) by the NJDEP or the Pine Barrens Commission.

To determine whether or not federal or state threatened, endangered or special concern species may be present within the ROI of the alternative alignments, a preliminary species survey and habitat evaluation was undertaken by the Navy on August 16 and 23, September 6, and October 11, 2007 (U.S. Navy 2007e). This survey served as a basis for development of intensive presence or absence surveys lasting more than one year. These surveys were completed on October 15, 2008 (U.S. Navy 2008d). The target species consisted of those that were previously confirmed to exist in the vicinity of the four proposed alternative alignments, and additional species for which suitable habitat was found to be present. This was based on the 2007 on-site habitat evaluation and a previous intensive rare species survey conducted by NJDEP Division of Fish, Game and Wildlife entitled: *Rare Species Survey: Naval Weapons Station - Earle 1988,* prepared by C. David Jenkins, Jr. Sr. Zoologist Endangered and Nongame Species Program February, 1988 (NJDEP 1988). In addition, the site was evaluated for all Pinelands and state-listed imperiled or rare plant species.

Surveys were conducted using various accepted standard sampling techniques for determining the presence of each target species at NWS Earle. Surveys were conducted under optimal seasonal and weather conditions for observing target species in their native habitats, which is based on the biology of each individual species. The survey methods followed accepted guidelines and protocol of the USFWS, NJDEP NJDFW and the Pinelands Commission.

The target species and a description of the habitat in which they are typically found are listed in Table 3-33.

Several young specimens of what are tentatively determined to be the state-listed rare basket oak were found in the vicinity of Alternative Alignment 1, 2, and 3 on the northern side of the one-lane bridge at Hockhockson Brook (U.S. Navy 2008d). The basket oak is associated with swamp white oak (*Quercus bicolor*), a similar looking species often confused with basket oak, especially in young specimens. The two species can be readily identified by the acorns, which were not obtainable during field surveys due to the age of the trees. In addition, surveys identified the state-listed imperiled southern twayblade adjacent to one of the potential basket oaks (U.S. Navy 2008d). The nearest potential basket oak and southern twayblade are located approximately 120 feet from the limits of disturbance associated with the proposed action. The Pine Barrens treefrog and New Jersey rush, state threatened and state endangered, respectively, were confirmed to be present within the survey area near Alternative Alignment 4, along existing Macassar Road where it crosses the power line right-of-way. In addition, a specimen of southern twayblade and Swamp Pink, were identified near the stands of Atlantic white cedar to the east of Macassar Road (Figure 3-8). The Swamp Pink is a federally-listed threatened, state-endangered plant. The New Jersey Rush was located approximately 100 feet from the limit of disturbance associated with Alternative Alignment 4 and the Swamp Pink and southern twayblade were located approximately 250 feet from the limit of disturbance associated with Alternative Alignment 4.

The Swamp Pink location is known to NWS Earle, as it was discovered during previous species surveys. In addition, the location of four other state-listed plant species known to NWS Earle were re-confirmed (Knieskern's beaked rush, Pale beaked rush, Pine Barrens reed grass, and Barrett's sedge) (U.S. Navy 2008d). Each of these known species are at least 450 feet from the limits of disturbance associated with the proposed action.

The state-threatened Cooper's hawk was visually identified along Macassar Road in the vicinity of the power line right-of-way. The birds were observed flying into and reemerging from the Atlantic white cedar stands along the power line right-of-way (Figure 3-8). Adults and one-year-old immature birds, which were molting into sub-adult plumage, were observed on several occasions. Territorial responses to call playback were observed along Alternative Alignment 4 along the power line right-of-way (U.S. Navy 2008d). The breeding location (nest) of the adult Cooper's hawk were not identified; however, it is likely within the area where the most vigorous territorial response and calling behaviors were observed (U.S. Navy 2008d). This area encompasses the Atlantic white cedar stands (Figure 3-8) along the power line right-of-way to the east of Macassar Road.

No state- or federally-listed species were detected or are known to occur within the limits of disturbance of any of the alternative alignments considered in this EIS.

Table 3-33 Target Species of Preliminary Species Survey 2007

Species	Status	Typical Habitat
FEDERAL SPECIES		
Bog turtle (*Glyptemys [Clemmys] muhlenbergii*)	Federally threatened / state endangered	sphagnum bogs and wet, grassy pastures characterized by soft, muddy substrates and perennial groundwater seepages (NJDEP 2004)
Swamp pink (*Helonias bullata*)	Federally threatened / state endangered	deciduous headwater swamps; adjacent stream corridors; red maple swamps; Atlantic white cedar swamps (U.S. Navy 2001)
Knieskern's beaked rush (*Rynchospora knieskernii*)	Federally threatened / state endangered	open, moist, sandy soils of pitch pine lowlands and also in disturbed ground such as inactive sand and gravel pits, road shoulders, and railroad and power line right-of-ways (U.S. Navy 2001)
STATE SPECIES		
Corn snake (*Elaphe g. Guttata*)	State endangered	mature, upland pine-dominated forests that contain uprooted trees and rotten logs (NJDEP 2004)
New Jersey rush (*Juncus caesariensis*)	State endangered	sphagnum bogs and savannas, seepage areas adjacent to Atlantic white cedar swamps, and stream corridors; disturbed habits (i.e., roadside ditches and railroad and power line right-of-ways) (U.S. Navy 2001)
Northern pine snake (*Pituophis m. Melanoleucus*)	State threatened	dry pine-oak forest types growing on very infertile sandy soils (NJDEP 2004)
Pine barrens treefrog (*Hyla andersonii*)	State threatened	standing acidic water (pH 4.2 to 5.2) in pitch pine lowlands, pine-oak and oak-pine stands, Atlantic white cedar swamps, bogs, and red maple swamps of the pinelands (U.S. Navy 2001); open canopied wetlands (U.S. Navy 2007e)
Barred owl (*Strix varia*)	State threatened	woodlands; mature wooded bottomlands, river valleys, and floodplains (U.S. Navy 2001)
Cooper's hawk (*Accipiter cooperii*)	State threatened	mature woodlands; woods with large canopy trees, mature understory, and dense ground layer; scattered openings and edge for feeding (U.S. Navy 2001)
Red-shouldered hawk (*Buteo lineatus*)	State threatened State endangered (breeding)	woodlands; mature wooded bottomlands, river valleys, and floodplains (U.S. Navy 2001)

Species	Status	Typical Habitat
Pine barrens reed grass (*Calamovilifa brevipilis*)	Pinelands Commission listed rare	pitch pine lowlands; moist but not saturated soils; disturbed habitats (i.e., roadside ditches and railroad and power line right-of-ways) (U.S. Navy 2001)
Barratt's sedge (*Carex barratti*)	Pinelands Commission listed rare	wetland swales; sedge and grass savannas; margins of bogs and Atlantic white cedar swamps; disturbed habitats (i.e., roadside ditches and railroad and power line right-of-ways) (U.S. Navy 2001)
Basket oak (*Quercus michauxii*)	State ranked rare (S3)	wetland forests
Southern twayblade (*Listera australis*)	State ranked-imperiled (S2)	sphagnum bogs, acidic forested swamps
Pale beaked rush (*Rynchospora pallida*)	State ranked rare (S3)	Pitch pine lowlands, bogs (U.S. Navy 2001)
Curly grass fern *(Schizaea pusilla)*	State ranked rare (S3)	In New Jersey found in association with Atlantic white cedar; sandy spots on hummocks in bogs, streams and river banks (Pinelands Preservation Alliance 2002)
Slender nut-rush *(Scleria minor)*	State ranked rare (S2)	Open sphagnum bogs; cedar swamps ; stream side savannas (Pinelands Preservation Alliance 2002)
Cranefly orchid *(Tipularia discolor)*	State ranked rare (S3)	Rich mesic woods with filtered light (Newcomb 1977)
Sickle-leaf golden-aster *(Pityopsis [chyopsis] falcate)*	State ranked rare (S3)	Dry open sandy areas; roadsides; sand mining areas (Pinelands Preservation Alliance 2002)
Stiff tick-trefoil *(Desmodium strictum)*	State ranked rare (S2)	Dry, open woods; roadsides (Pineland Preservation Alliance 2002)
Racemed milkwort *(Polygala polygama)*	State ranked rare (S3)	Dry woods and clearings (Newcomb 1977)
Pine Barrens bellwort *(Uvularia puberula var. nitida)*	State endangered	Moist to wet sand along edges of swamps, pitch pine lowlands; bogs (Boyd 1991)
Pickering's reed grass *(Calamagrostis pickeringii)*	State endangered	Peaty barrens; bogs; powerline rights-of-way (Gordon 2009)
Variable sedge *(Carex polymorpha)*	State endangered	Dry, sandy open woods; powerline rights-of-way (Gordon, 2009)
Red milkweed *(Asclepias rubra)*	State ranked rare (S2)	Pinelands swamps; bogs; cedar swamp openings;savannas (Pinelands Preservation Alliance 2002)
Pine Barren smoke grass *(Muhlenbergii torreyana)*	State ranked rare (S3)	Damp; open sandy barrens; peaty bogs; swales (Pinelands Preservation Alliance 2002)
Wild lupine *(Lupinus perennsis)*	State ranked rare (S3)	Open dry sandy soils; edges of woods; roadsides (Boyd 2001)
Eastern silvery aster *[Aster (Symphyotrichum) concolor]*	State ranked rare (S2)	Dry, sandy soils; open woods (Pinelands Preservation Alliance 2002)

3.11 WATER RESOURCES AND WETLANDS

3.11.1 Surface Water

The NWS Earle mainside area is divided into three watershed basins which are formed by the Hominy Hills Ridge. Marsh Bog and Mingamahone Brooks, tributaries of the Manasquan River, drain the southern portion of mainside. Shark River tributaries drain the eastern portion. Mine, Hockhockson, Yellow, and Pine Brooks drain the northern portion of mainside. The Hockhockson and Pine Brooks flow north into the Swimming River, downstream of the Swimming River Reservoir dam (Colts Neck Township 1983), and then to Navesink River. Each of these riverine systems originates on mainside (Figure 3-10).

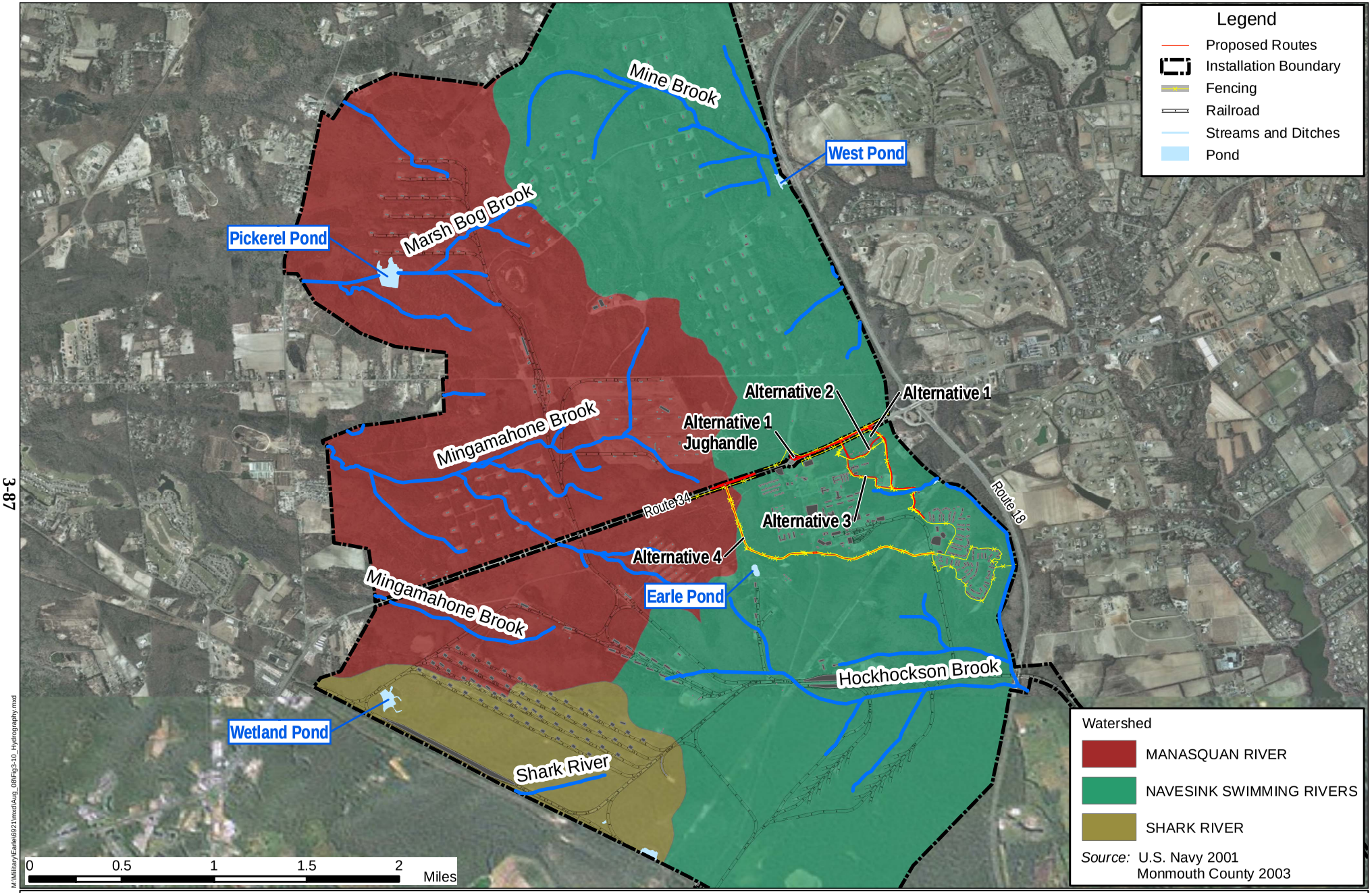


Figure 3-10
Hydrology at
Mainside, NWS Earle

The New Jersey surface water classification for Hockhockson and Pine Brooks on mainside is Fresh Water 2, trout maintenance, Category 2 [FW2-TM(C2)] (NJDEP 2006). FW2 is the surface water classification applied to those fresh waters that are not designated as FW1 (designated to be maintained in their natural quality state) or Pinelands Waters (pinelands protection areas). Trout maintenance waters are designated for the support of trout, and C2 indicates the water body is not designated C1 (outstanding resource waters). The surface water classification of the Shark River, Marsh Bog, Mingamahone, and Mine Brooks is FW2-TM(C1).

The only open water body in the study area is Earle Pond, which is not fed by streams and is 1.3 acres in size. It is located approximately 400 feet west of Lake Earle Road.

3.11.2 Groundwater

The Magothy Aquifer, which is part of the North Atlantic Coastal Plain Aquifer system, underlies NWS Earle. The Severn-Magothy Aquifer runs from the New Jersey Coastal Plain southward along the Delmarva Peninsula and then along the Maryland side of the Chesapeake Bay (U.S. Geological Survey [USGS] 1997 in U.S. Navy 2001). This aquifer is composed of permeable sand beds of the late Cretaceous age (140-65 million years ago). At the northernmost limit, the aquifer is slightly above sea level, sloping to depths of 2,000 feet below sea level in the southeast. Confining units of silt and clay overlie this aquifer. This aquifer is locally divided into the Wenonah-Mount Laurel Aquifer, the Englishtown Aquifer, and the upper Magothy portion of the Raritan-Magothy Aquifer.

The Wenonah-Mount Laurel Aquifer is predominately composed of fine to medium glauconitic sand; the Englishtown Aquifer is composed of fine to medium sand with some beds of silt and clay; and the Magothy Aquifer consists of well-stratified to crossbedded, fine to medium sand (USGS 1997 in U.S. Navy 2001). Each aquifer is separated from each underlying aquifer by a confining unit, usually of clay and silt. The maximum thickness of these aquifers is 720 feet, with an average thickness of 340 feet. In 1985 the New Jersey Water Supply Administration declared these aquifers as Critical Area 1. This designation was imposed because of excessive water withdrawals, which had the potential to significantly threaten the long-term integrity of the water supply source (New Jersey Water Supply Administration 1999 in U.S. Navy 2001).

Groundwater at mainside is classified Class II. Class II groundwaters include all areas that are not designated as Class I or Class III. Class I groundwaters are those within watersheds of FW1 surface waters, State-owned Natural Areas, and the major aquifers of the Pinelands Area. Class III ground waters can be used for anything other than for potable water. Class II criteria specify the levels of constituents above which the water would pose an unacceptable risk for drinking water. The designated use of Class II groundwaters is to provide potable water using conventional treatment. Both existing and potential potable water uses are included (NJDEP 2006).

Within the ROI there are three IRP sites as described in Section 3.12.2 that have identified groundwater contamination and have restrictions placed on the groundwater use in those areas.

These IRP sites are areas where releases of hazardous substances from past waste disposal operations or past hazardous material spills have occurred and are in the process of, or under study for, remedial actions. Groundwater in the ROI is not used to supply drinking water.

3.11.3 Floodplains

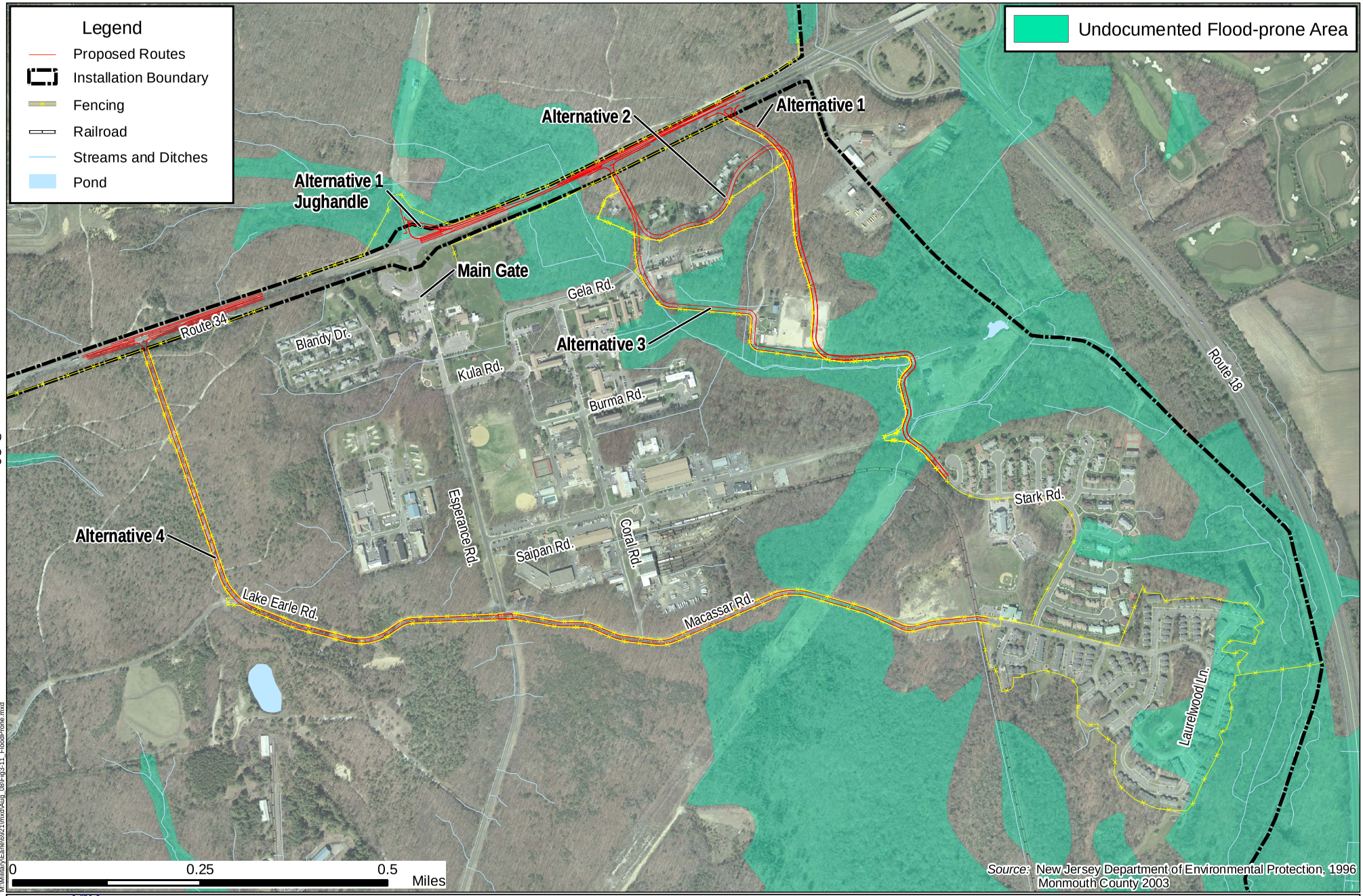
Executive Order (EO) 11988, Floodplain Management, instructs federal agencies to consider the risks, danger, and potential impacts of locating projects within floodplains. The EO specifies that, in situations where alternatives are impractical, the agency must minimize potential harm to or within the floodplain and take appropriate steps to notify the public. Floodplains typically are described as areas likely to be inundated by a particular flood. For example, a flood that has a one percent chance of occurring in any one year is the 100-year flood.

The Federal Emergency Management Agency (FEMA) has designated the NWS Earle mainside area as an area that has not been mapped. A flood study has not been conducted for the area (U.S. Navy 2004a). In the 1970s, the USGS mapped areas that may be flood-prone based on an analysis of natural topography and past flooding conditions, without site-specific consideration of any existing flood controls. These areas were digitized and published by NJDEP, and are shown in Figure 3-11 (NJDEP 1996). The flood-prone areas generally have a potential one in one hundred chance of inundation in any year and are used for planning and analysis purposes only. They do not carry the regulatory authority of the FEMA designations. All four alternative alignments cross portions of the potential flood-prone areas.

On November 5, 2007, the state of New Jersey enacted the Flood Hazard Area Control Act (FHACA), (N.J.A.C. 7:13). New Jersey Department of Environmental Protection has published rules implementing the Act (NJDEP 2007c). Flood hazard areas must be determined for any regulated waters using one of six specified methods. All waters in New Jersey are regulated except any manmade canal; coastal wetlands regulated under the Wetlands Act of 1970 (N.J.S.A. 13:9A-1 et seq.); and any segment of water that has a drainage area of less than 50 acres, provided one or more of the following applies.

- The water has no discernible channel.
- The water is confined within a lawfully existing, manmade conveyance structure or drainage feature, such as a pipe, culvert, ditch, channel or basin (not including any water that historically possessed a naturally-occurring, discernible channel, which has been piped, culverted, ditched or similarly modified).
- The water is not connected to a regulated water by a channel or pipe, such as an isolated pond or depression that has no outlet.

These waterways are subject to a regulated “riparian zone” under the new FHACA Rules.



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Figure 3-11
Floodprone Areas

The surface waters identified in the study area include Hockhockson Brook and unnamed tributaries that flow to it. All surface waters in the study area have been classified as FW2-TM(C2) waters according to the NJDEP Surface Water Quality Standards (Refer to Section 3.11.1). All waters in the study area therefore will have a 150-foot riparian zone associated with them. Activities in riparian zones including the clearing, cutting and/or removal of vegetation are regulated by the NJDEP under the FHACA Rules. Certain permits are available from the NJDEP to conduct limited activities within the regulated riparian zones.

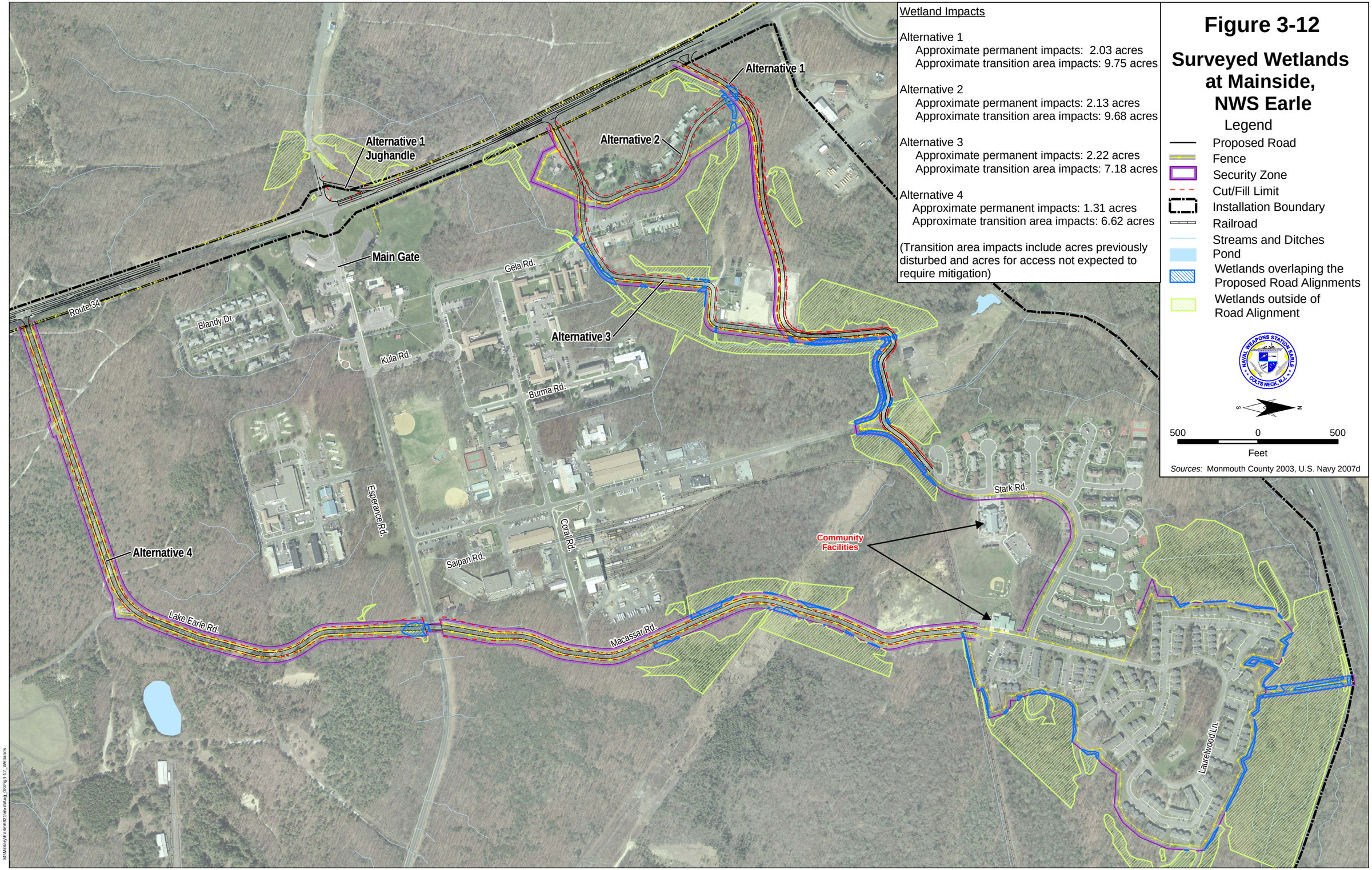
3.11.4 Wetlands

Wetlands identification and delineations were conducted on the four alternative alignments as part of this EIS (U.S. Navy 2007d). In addition, all land within 150 feet of each of the four alignments and areas north and south of Tarawa Road to the west of Route 34 (across from the main gate) were also investigated. The wetland delineation was conducted in accordance with the three parameter approach described in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989),* and the *FWPA*. Wetlands were classified according to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al 1979). In 1994, The NJDEP assumed responsibility for administering the federal wetlands program (also known as the 404 program) in delegable waters of New Jersey (59 FR 9933). Wetlands at NWS Earle are delegable waters and fall under the NJDEP's authority. In non-delegable waters, the U.S. Army Corps of Engineers retains jurisdiction under federal law, and both federal and state requirements apply.

The boundaries of 36 wetland areas were delineated and are shown on Figure 3-12. Sample points were collected in uplands and wetlands. All delineated wetlands drain to Hockhockson Brook, and are therefore within the Hockhockson Brook Drainage Basin.

3.11.4.1 Wetland Classifications

Wetland characteristics and functions can vary widely, so standard descriptions have been developed to provide a consistent wetland classification system (Cowardin, et al 1979). The majority of wetlands delineated along Alternative Alignments 1, 2, and 3 are forested and are classified PFO1B (palustrine forested broad-leaved deciduous, saturated). Emergent wetlands, PEM1A (palustrine emergent persistent, temporarily flooded) occur along the existing Gela and Saipan Roads portion of these alignments. Riverine wetlands, R20W (riverine lower perennial open water) and R2EM2A (riverine lower perennial emergent non-persistent) also occur along existing Saipan Road; these are unnamed tributaries to Hockhockson Brook. Along the north side of Stark Road at the power line crossing near the Stark Road housing complex is a scrub-shrub wetland, PSS1B (palustrine scrub-shrub broad-leaved deciduous, saturated) (U.S. Navy 2007d).


Alternative 1
Alternative 1
Jughandle
Alternative 2
Main Gate
Gela Rd.
Route 34
Blandy Dr.
Kula Rd.
Alternative 3
Burma Rd.
Esperance Rd.
Coral Rd.
Saipan Rd.
Alternative 4
Lake Earle Rd.
Macassar Rd.
Stark Rd.
Community Facilities
Laurelwood Ln.
Wetland Impacts
Alternative 1
Approximate permanent impacts: 2.03 acres
Approximate transition area impacts: 9.75 acres
Alternative 2
Approximate permanent impacts: 2.13 acres
Approximate transition area impacts: 9.68 acres
Alternative 3
Approximate permanent impacts: 2.22 acres
Approximate transition area impacts: 7.18 acres
Alternative 4
Approximate permanent impacts: 1.31 acres
Approximate transition area impacts: 6.62 acres
(Transition area impacts include acres previously disturbed and acres for access not expected to require mitigation)
Figure 3-12
Surveyed Wetlands at Mainside, NWS Earle
Legend
Proposed Road
Fence
Security Zone
Cut/Fill Limit
Installation Boundary
Railroad
Streams and Ditches
Pond
Wetlands overlaping the Proposed Road Alignments
Wetlands outside of Road Alignment
NAVAL WEAPONS STATION EARLE COLTS NECK, N.J.
S
N
500
0
500
Feet
Sources: Monmouth County 2003, U.S. Navy 2007d
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Delineated wetlands along Alternative Alignment 4 are mainly forested (PFO1B) with portions of emergent (PEM1A) and scrub-shrub (PSS1B). Emergent wetlands are present at the intersection of Lake Earle and Esperance Roads, in a stormwater ditch along Macassar Road, and along the power line crossing. Scrub-shrub wetlands are present on the west side of Macassar Road and along the power line crossing. Along the east side of Macassar Road, a deciduous forested wetland complex, fed by groundwater seeps, becomes a palustrine forested Atlantic white cedar dominated (PFO8B) wetland in the vicinity of a tributary to Hockhockson Brook. This wetland becomes an emergent wetland at the power line right-of-way (U.S. Navy 2007d).

3.11.4.2 Wetland Functions and Resource Value Classifications

Wetland Functions

All of the wetlands delineated provide the functions of flood storage and groundwater recharge/discharge. Most of the delineated wetlands also provide sediment/toxicant retention and nutrient removal/retention/transformation. The diversity of wetland and upland communities provides habitat to a variety of wildlife species. Direct evidence of wildlife in the study area included animal carcasses, scat, tracks, and direct observations of deer, fox, songbirds, and raptors (U.S. Navy 2007d).

The presence of threatened or endangered wildlife species was not observed at the time of the wetland delineation. However, federal and state-protected threatened and endangered flora and fauna are known to occur within or adjacent to the delineated areas (refer to Section 3.10.3).

Wetland Resource Value Classifications

In New Jersey, wetlands are classified according to their resource value as designated by the FWPA (N.J.S.A. 13:9a) and are subject to transition area protection based upon this classification. Transition area means an area of upland adjacent to a freshwater wetland which minimizes adverse impacts on the wetland or serves as an integral component of the wetlands ecosystem (N.J.A.C. 7:7A-1.4). Wetlands of exceptional resource value are defined by the State of New Jersey as freshwater wetlands which discharge into FW1 or FW2-TP (trout production) waters, or which are documented habitats for endangered or threatened species (N.J.A.C. 7:7A-2.5). Wetlands of ordinary resource value include ditches, swales, detention facilities, and certain isolated wetlands that are less than 5,000 square feet in size and have disturbed land surrounding 50 percent of the area immediately adjacent to it. Wetlands that do not fit either of the above classifications are defined as intermediate resource value. Exceptional resource value wetlands are subject to a 150-foot standard transition area. Wetlands of intermediate resource value are subject to a 50-foot standard transition area. No transition area is required for ordinary resource value wetlands (N.J.A.C. 7:7A-6). In addition, State open waters are not subject to transition area protection.

The majority of the wetlands within the study area are anticipated to be exceptional resource value and be subject to 150-foot standard transition areas. Two wetland areas, located at the

intersection of Lake Earle and Esperance Roads along Alternative Alignment 4, are anticipated to be of intermediate resource value and be subject to 50-foot standard transition areas. Final resource value classifications would be determined via an NJDEP issued Letter of Interpretation for the delineation area (U.S. Navy 2007d).

3.11.4.3 Wetland Vegetation

The forested wetland canopy vegetation within the delineated area consists of sweet gum, swamp white oak (*Quercus bicolor*), black gum, and red maple. The forested wetland subcanopy is largely comprised of sweetgum, red maple, and black gum saplings. One forested wetland canopy is dominated by Atlantic white cedars. The scrub/shrub layer is predominantly made up of fetterbush (*Leucothoe racemosa*), highbush blueberry, and sweet pepper bush. The forested wetland herbaceous layer is comprised of red maple and sweetgum seedlings, beardgrass (*Eulalia viminea*), and stout wood reed (*Cinna arundinacea*). American beech is present in several forested wetlands.

American beech is typically considered an upland species, however these beech display morphological traits that indicate they are regularly saturated, such as buttressing at the base of the tree and shallow root systems. With the exception of several large trees the majority of the forest is secondary growth. The scrub/shrub wetlands are composed of sweet gum and red maple saplings, multiflora rose and highbush blueberry in the shrub layer and soft rush (*Juncus effuses*), beardgrass, deer tongue grass, and several sedge species (*Carex* sp.) in the herbaceous layer. The emergent wetlands are composed of soft rush, sedge species, and fescue species (*Festuca* sp.).

3.11.4.4 Wetland Soils

Hydric (wetland) soils within the investigated area were documented at each sample location. Soils sampled along the roads and railroad tracks indicated historical disturbance. Of the soils identified in the soil survey, Atsion sand, Humaquepts, Klej loamy sand, Lakehurst sand, Manahawkin muck, and Shrewsbury sandy loam, were considered locally hydric by New Jersey's list of hydric soils generated by the United States Department of Agriculture and the Natural Resources Conservation Service (refer to Figure 3-7).

3.11.4.5 Hydrology

During the wetland delineation many of the wetlands did not exhibit ponding or flooding (U.S. Navy 2007d). However, soil in some locations was documented as being saturated in the top 14 inches. Other field indicators of hydrology include exposed roots, redoximorphic features in the soil matrix, buttressing, drift lines, drainage patterns, hummocky topography, water marks, and sediment deposits. Hydric indicators act as primary or secondary indicators of hydrology. One primary indicator or two secondary indicators satisfy the hydrology parameter for the wetlands.

3.12 ENVIRONMENTAL HEALTH AND SAFETY

The ROI for potentially contaminated sites includes identified sites located near the four potential alignment alternatives. With regard to hazardous/toxic materials and waste disposal as well as safety, the ROI is the Laurelwood housing area and the right-of-way for each alternative alignment. The ROI for environmental justice populations includes mainside NWS Earle (specifically Census Tract 8099.33) as well as the Colts Neck Township and Tinton Falls Borough.

3.12.1 Hazardous/Toxic Materials and Waste Disposal

A hazardous substance is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either on its own or through interaction with other factors. The terms "hazardous material," "toxic substance," and "hazardous waste" are used in this section, first to emphasize that they are all hazardous substances that may present a substantial threat to public health, welfare, and the environment; and second, to define the terms in reference to their unique applications under specific federal regulations.

Hazardous substances are defined and regulated in the U.S. primarily by laws and regulations administered by the U.S. Occupational Safety and Health Administration (OSHA), USEPA, and U.S. Department of Transportation (USDOT). Each agency incorporates hazardous substance terminology in accordance with its unique Congressional mandate. Therefore, OSHA regulations categorize substances in terms of their impacts on employee and workplace health and safety, USDOT regulations in terms of safety in transportation, and USEPA regulations in terms of protection of environment and public health.

In terms of their environmental impacts, hazardous materials, toxic substances, and hazardous wastes are regulated under federal programs administered by USEPA, including the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C. §§ 9601 et seq.), Emergency Planning and Community Right-to-Know Act (EPCRA) (42 U.S.C. § 11011 et seq.), Toxic Substances Control Act (TSCA) (15 U.S.C. §§ 2601 et seq.), and Resource Conservation and Recovery Act (RCRA) (42 U.S.C. §§ 321 et seq.). Department of Defense installations are required to comply with these laws and all other applicable federal, state and DoD regulations, as well as 40 CFR 26 112 and EO 13423 (24 January 2007).

The OSHA Hazard Communication regulation (29 CFR 1910.1200) defines a hazardous chemical as any chemical which is a physical or health hazard. The definition includes chemicals which are carcinogens (a cancer causing substance or agent), toxins, toxic agents, irritants, corrosives, and sensitizers; agents which act on the hematopoietic system (affect the formation of blood); agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, unstable (reactive), or water-reactive; oxidizers; pyrophorics (capable of spontaneous combustion); and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gasses, fumes, vapors, mists, or smoke that may

have any of the previously mentioned characteristics. Currently, OSHA regulates workplace exposure to approximately 400 substances, including dusts, mixtures, and common materials such as paints, fuels, and solvents.

In CERCLA Section 101(14), USEPA defines the term "hazardous substance" by reference to provisions in other environmental statutes that identify substances as hazardous (e.g., the OSHA definition as described above). USEPA's definition includes any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment and any substance for which a reportable quantity is established in 40 CFR 302.4.

Section 105(a)(8)(B) of CERCLA as amended, requires that a list of national priorities be developed from among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. This list, which is Appendix B of the National Contingency Plan, is known as the National Priorities List. Sites are listed on the National Priorities List upon completion of Hazard Ranking System screening, public solicitation of comments about the proposed site, and after all comments have been addressed. The National Priorities List primarily serves as an information and management tool and is part of the Superfund cleanup process. Naval Weapons Station Earle was placed on the National Priorities List in 1990 and a Federal Facility Agreement between the Navy and the USEPA was signed in 1991.

The USDOT hazardous materials Regulations (49 CFR 171) define a hazardous materials as a substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The USDOT definition of "hazardous material" includes hazardous substances, hazardous wastes, and marine pollutants.

The promulgation of TSCA represented an effort by the federal government to address those chemical substances and mixtures for which it was recognized that the manufacture, processing, distribution, use, or disposal may present an unreasonable risk of injury to health or the environment, and to effectively regulate these substances and mixtures in interstate commerce. Toxic chemical substances regulated by USEPA under TSCA include asbestos, lead, and polychlorinated biphenyls (PCBs), as well as more than 62,000 chemicals and substances on TSCA Chemical Substances Inventory lists.

In regulations promulgated under RCRA, USEPA defines hazardous waste as a solid waste which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) and exhibits any of the characteristics (ignitability, corrosivity, reactivity, toxicity) described in 40 CFR 261; or is listed in 40 CFR 261 Subpart D; or is a mixture containing one or more listed hazardous wastes. Hazardous Waste may take the form of solid, liquid, contained gaseous, or semi-solid wastes (e.g., sludges), or any combination of wastes, that pose a substantial present or potential hazard to human health or the environment and have been discarded or abandoned. Military munitions used for their intended purposes on ranges, or collected for further evaluation, such as recycling, are not considered waste per the Military Munitions Rule (40 CFR 266.202).

3.12.1.1 Hazardous Materials

Routine operations on NWS Earle require use of a variety of hazardous materials, including petroleum, oil, and lubricant (POL) products, solvents, cleaning agents, paints, adhesives, and other products necessary to perform ship, ground vehicle, and equipment maintenance, military training activities, facilities repair and maintenance, and administrative and housing functions. Hazardous materials are not stored at any of the housing areas at NWS Earle with the exception of small quantities of gasoline used by contractors for lawn maintenance equipment and small quantities of materials typical of a residence.

Bulk quantities of fuels (e.g., heating oil, gasoline, diesel, and kerosene) and other POLs (products and wastes) are managed in aboveground and underground storage tanks (ASTs and USTs), pumps, pipelines, and oil/water separators across NWS Earle, and these storage locations and facilities represent potential sources of small spills. Emergency generators are typically supplied with diesel fuel or natural gas stored in tanks. The ASTs and USTs and associated systems and operations at NWS Earle are managed in accordance with federal and state regulations and the NWS Earle Spill Prevention Control and Countermeasures Plan.

There are three USTs located in industrial areas at NWS Earle and all are regulated by the NJDEP. However no USTs or ASTs are located in the Laurelwood housing area or in the right-of-way of the four alternatives (Cappeto 2008).

3.12.1.2 Toxic Substances

Toxic substances commonly occurring on Navy Installations include asbestos, lead-based paint (LBP), PCBs, and radon.

Asbestos. Asbestos is the name of a group of naturally occurring minerals that separate into strong, very fine fibers, which are heat-resistant and extremely durable. Asbestos has been used in a variety of forms for insulation (thermal and acoustical) and decorative purposes, and it is typically found on boilers, pipes, and in many other appliances and construction materials, for example, in plastics, sealers and adhesives, where it was used to add strength, and in concrete structures. Asbestos becomes a health hazard when its microscopic-sized fibers are released into the air. This can happen when asbestos-containing material is disturbed, and once emitted to the atmosphere, these fibers can remain suspended in the air for long periods of time. When inhaled, asbestos fibers can easily lodge in body tissues, especially the lungs. Exposure to airborne friable asbestos may result in a potential health risk because persons breathing the air may breathe in asbestos fibers. Continued exposure can increase the amount of fibers that remain in the lung. Fibers embedded in lung tissue over time may cause serious lung diseases including: asbestosis, lung cancer, or mesothelioma (USEPA 2008a). Many other fibrous materials (e.g., fiberglass, mineral wool) have been used over the years as substitutes for asbestos, and it is not possible to reliably distinguish asbestos fibers from non-asbestos fibers with the naked eye.

The Navy policy with regard to asbestos states that only non-asbestos materials will be used during construction, overhaul, and repair and maintenance of shore facilities when suitable

substitutes exist; and that the Navy will identify suitable asbestos-free substitute materials for asbestos materials still in use.

Naval Weapons Station Earle manages asbestos in shore facilities and asbestos waste in accordance with CNIC Instruction 5100.1, Asbestos Management Program.

Naval Facilities Engineering Command conducted an asbestos survey of military family housing areas at NWS Earle in November/December 1994 and May/June 1996 (U.S. Navy 1997a). None of the materials sampled in the Laurelwood housing area were found to contain asbestos and results of the assessment show that no potential hazards exist due to asbestos containing materials (U.S. Navy 1997a).

Lead. Exposure to lead is associated with adverse health effects, including damage to the central nervous system (USEPA 2008b). In the past, white lead pigments were used to make durable paint products, and red lead pigments were used in primers to inhibit corrosion when applied to metal surfaces. Lead exposure can result from the ingestion of paint chips or dust from deteriorating paints or from improper paint removal. Young children are at greatest risk from this exposure. DoD policy with regard to LBP is to manage LBP in a manner protective of human health and the environment and to comply within applicable federal, state, and local laws and regulations governing LBP hazards. Painted surfaces can be tested to determine if LBP is present.

Naval Facilities Engineering Command conducted a lead survey for all military family housing areas at NWS Earle in November/December 1994 and May/June 1996 (U.S. Navy 1997b). Lead was assessed in paint, in dust, and in soil. Soil samples were collected from foundation areas, roadsides, walkways, and driveways. Background soil samples were also collected to identify natural background occurrences of lead at the sampling locations. Lead based paint was not assessed at the Laurelwood housing area because housing units were built after 1978 when LBP was banned. A total of 14 randomly selected Laurelwood housing units were inspected for lead in dust. The samples analyzed did not have levels that exceeded the corresponding action limit established by the U.S. Department of Housing and Urban Development. A total of 15 randomly selected Laurelwood housing units were inspected for lead in soil. The samples analyzed did not have lead levels that exceeded the action limit established by the USEPA (U.S. Navy 1997b).

Polychlorinated biphenyls. Polychlorinated biphenyls belong to a broad family of man-made organic chemicals known as chlorinated hydrocarbons. Polychlorinated biphenyls were domestically manufactured from 1929 until their manufacture was banned in 1979. They have a range of toxicity and vary in consistency from thin, light-colored liquids to yellow or black waxy solids. Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications. Once in the environment, PCBs do not readily break down and therefore may remain for long periods of time cycling between air, water, and soil. Polychlorinated biphenyls

have been demonstrated to cause cancer, as well as a variety of other adverse health effects on the immune system, reproductive system, nervous system, and endocrine system (USEPA 2008c).

There are pad-mounted and pole-mounted transformers located throughout mainside NWS Earle. The installation's Public Works Center completed a comprehensive field survey of all transformers at NWS Earle. The survey resulted in the replacement of many older transformers and all transformers containing PCBs. Through this action, NWS Earle is now "PCB-free" (U.S. Navy 2003a).

Radon. Radon is a cancer-causing natural radioactive gas that you can't see, smell or taste (USEPA 2008d). In 1994, a radon assessment conducted for all family housing units at NWS Earle revealed that none of the units sampled had radon levels above the health-based limit of four picocuries per liter (U.S. Navy 2003a).

3.12.2 Installation Restoration Program

The DoD established the IRP in 1980 to identify, characterize, and remediate environmental contamination on military installations resulting from hazardous waste management practices. The IRP established a process to evaluate past hazardous waste management and disposal sites on DoD property to control the mitigation of contaminants and hazards to human health and the environment that may have resulted from past DoD operations and activities. Naval Weapons Station Earle manages its IRP in accordance with the Navy/Marine Corps Installation Restoration Manual, which represents a compilation of Defense Environmental Restoration Program requirements, policy, and guidance for both the U.S. Navy and U.S. Marine Corps and provides a synopsis of the laws and regulations that define and affect the IRP. Installation Restoration Program sites that are adjacent to the Laurelwood housing area and/or any of the four alternative alignments are summarized below and illustrated on Figure 3-13.

3.12.2.1 Site 1 (Operable Unit 8): Former Ordnance Demolition Site

Site 1 is a 6-acre open field near the intersection of Saipan Road and Macassar Road that was used for burning ordnance material between 1943 and 1975 (Figure 3-13). The site is bordered by Macassar Road to the east, a railroad spur to the north, and an 8- to 10-foot high soil berm to the west and south. During site abandonment, the area was plowed and a layer of diesel-soaked hay was burned on site to remove residual ordnance. This procedure was carried out three times. The site is currently clear of all structures (U.S. Navy 2004b).

A Phase II Site Investigation indicated low levels of metals, explosives and organics in the soil and groundwater. Additional soil and groundwater samples collected during a remedial investigation delineated the extent of the affected area. A feasibility study was completed in October 2002. The Proposed Plan and Record of Decision (September 2004) followed. The Navy and the USEPA, in consultation with NJDEP, selected the remedy that addresses groundwater contamination, including arsenic, by instituting land use controls, long-term monitoring, and 5-year reviews.

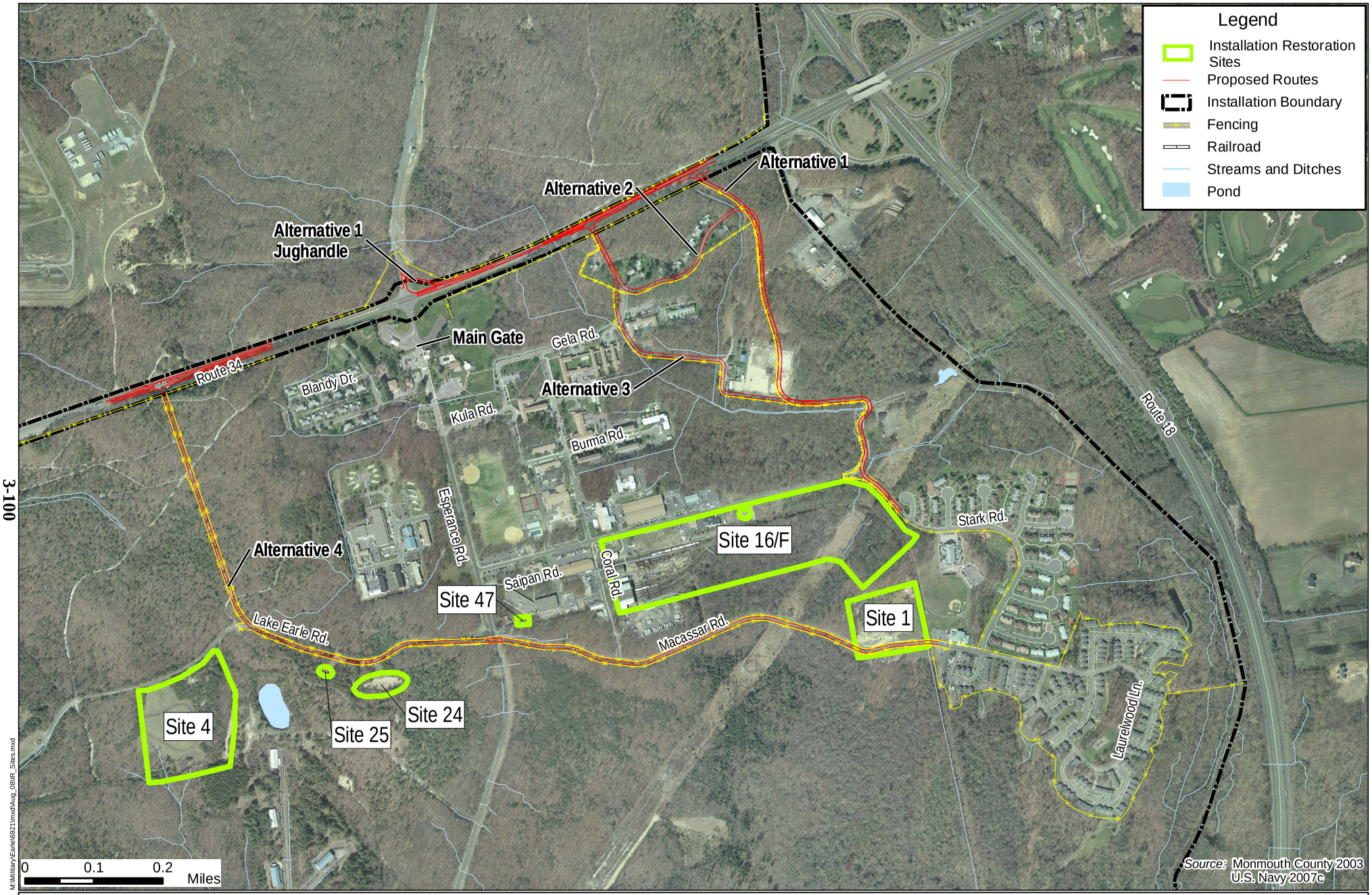


Figure 3-13
Installation Restoration Site Locations
Mainside, NWS Earle

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Among the land use controls is a requirement to notify the USEPA and the state of New Jersey in writing 60 days prior to the Navy leasing, transferring, or accessing the property, consult with the USEPA and the state of New Jersey on specific wording for property transfer, sale, or lease documents and provide USEPA and the state with copies of these documents (U.S. Navy 2004b).

A NJDEP groundwater Classification Exception Area will be implemented to prohibit human exposure to groundwater and the Base Master Plan (or similar document) will be amended to add a notice to future land owners stating that arsenic has been detected at a concentration above the NJDEP residential direct contact cleanup criteria in subsurface soil. Because contaminants remain on the site, a review of the site conditions and risks is conducted every 5 years as required by CERCLA (U.S. Navy, 2007c). Use of the aquifer beneath the site for purposes other than environmental monitoring and testing without Navy approval, will be prohibited, until groundwater is found to meet Federal Maximum Contaminant Levels and New Jersey groundwater quality standards (Helms 2008).

3.12.2.2 Site 16/F: Diesel Fuel Line to Building C-50/Roundhouse Area

Site 16 is located northwest of Building C-19 and addresses the leakage from an underground fuel line which occurred in June 1977 (Figure 3-13). The fuel line was used to transport diesel fuel from USTs located next to Building C-20 to a dispensing station located approximately 100 feet north/northwest of Building C-50. The fuel line was excavated and was determined to have leaked approximately 50 gallons of fuel. The USTs originally located adjacent to Building C-20 were removed. Site 16 is located within the approximate outline of another site, and the two sites are now referred to as Site 16/F. Site 16/F encompasses the entire railroad maintenance yard located in the mainside area that has been active since the late 1940s (U.S. Navy 2007c).

Sampling during a 1992 Site Investigation found hydrocarbon contamination area-wide in the soils. An extensive soil gas survey was conducted in 1995 across Site 16/F to determine any hot spots and to pick appropriate locations for monitoring wells. This investigation led to the discovery of a large concentration of free-product diesel fuel on top of the shallow groundwater. A pilot scale bioslurper system was installed in 1996 to determine whether the free-product fuel could be recovered. A large-scale system was designed in 1997 and was operated from February 1998 through May 1999.

Approximately 5,000 gallons of diesel fuel has been recovered using the bioslurper process. An Optimization Study was performed in June 2004 and additional wells were installed for free product removal. The bioslurper system is currently operating and routine groundwater monitoring is conducted in accordance with NJDEP UST regulations (U.S. Navy 2007c). Two monitoring wells associated with the site remediation process are located approximately 30 feet to the east of Stark Road near the intersection of Stark Road and Saipan Road. This portion of Stark Road would be part of Alternative Alignments 1, 2, and 3.

3.12.2.3 Site 47: Closed Pesticide Shop (Building S-86)

The Pesticide Shop was a small brick building used for storage and mixing of various pesticides and herbicides. A concrete pad was located on the northwest side of the building and an in-ground former septic leach tank was also reportedly located just north of the building (Figure 3-13) (U.S. Navy 2007c).

In 1991 all residual pesticide/herbicide product containers were removed from Building S-86 and properly disposed of as hazardous waste. Soil sampling in the vicinity of the building identified the presence of various pesticide compounds, including chlordane and 4,4 Dichlorodiphenyltrichloroethane (DDT), at levels above NJDEP Residential and Non-Residential Cleanup Criteria. Shallow groundwater testing revealed a slightly elevated reading for Endosulfan I. Sludge in the septic tank was found to contain chlordane. The excavation and off-site disposal of contaminated soils, the septic tank and its contents, and the demolition of the pesticide shop were conducted in 2000. Based on the removal action and the additional groundwater sampling, the USEPA issued a letter in October 2002 that no further action is warranted at the site (U.S. Navy 2007c).

3.12.2.4 Sites 24 and 25 (Operable Unit 4): Closed Pistol Ranges

Two small arms ranges are located south of Esperance Road along Lake Earle Road (Figure 3-13). A steeply sloping sand face forms the impact berm for each range (U.S. Navy 2007c).

A significant amount of lead slugs were present in the impact berms of Sites 24 and 25. Sampling and analysis of subsurface soil beneath the berms determined that the lead had not migrated. A removal action was performed in 1996 to remove the slugs. The metal bullets were mechanically removed from the impact berms soil and the soil was washed and placed back on the respective sites. Based on confirmation sampling following the removal action, no further action is planned for the sites. The Record of Decision for Operable Unit 4 was signed by the USEPA and the Navy in September 1999. No further action was outlined as the selected remedy (U.S. Navy 2007c).

3.12.2.5 Site 4 (Operable Unit 1): Landfill

Site 4 is a 5-acre site located east of Lake Earle Road that received approximately 10,200 tons of mixed domestic and industrial wastes from 1943 to 1960 (Figure 3-13) (U.S. Navy 2007c). Materials were placed in trenches, burned, and then covered with a thin layer of sandy soil. Pine trees were planted on much of the site in the early 1980s.

Low levels of solvents and metals have been detected in shallow groundwater at the landfill boundaries. After significant investigation, no concentrated source area of solvents could be identified. Samples collected during a remedial investigation in 1995 did not detect any migration of solvents into deeper aquifers. Polychlorinated biphenyls were found in one sediment sample at a very low concentration (U.S. Navy 2007c).

The Record of Decision for remediation of this site was signed in August 1997. The selected remedy consisted of grading and capping the landfill, prohibiting use of groundwater in the adjacent area, and long-term periodic monitoring of groundwater conditions (U.S. Navy 2007c).

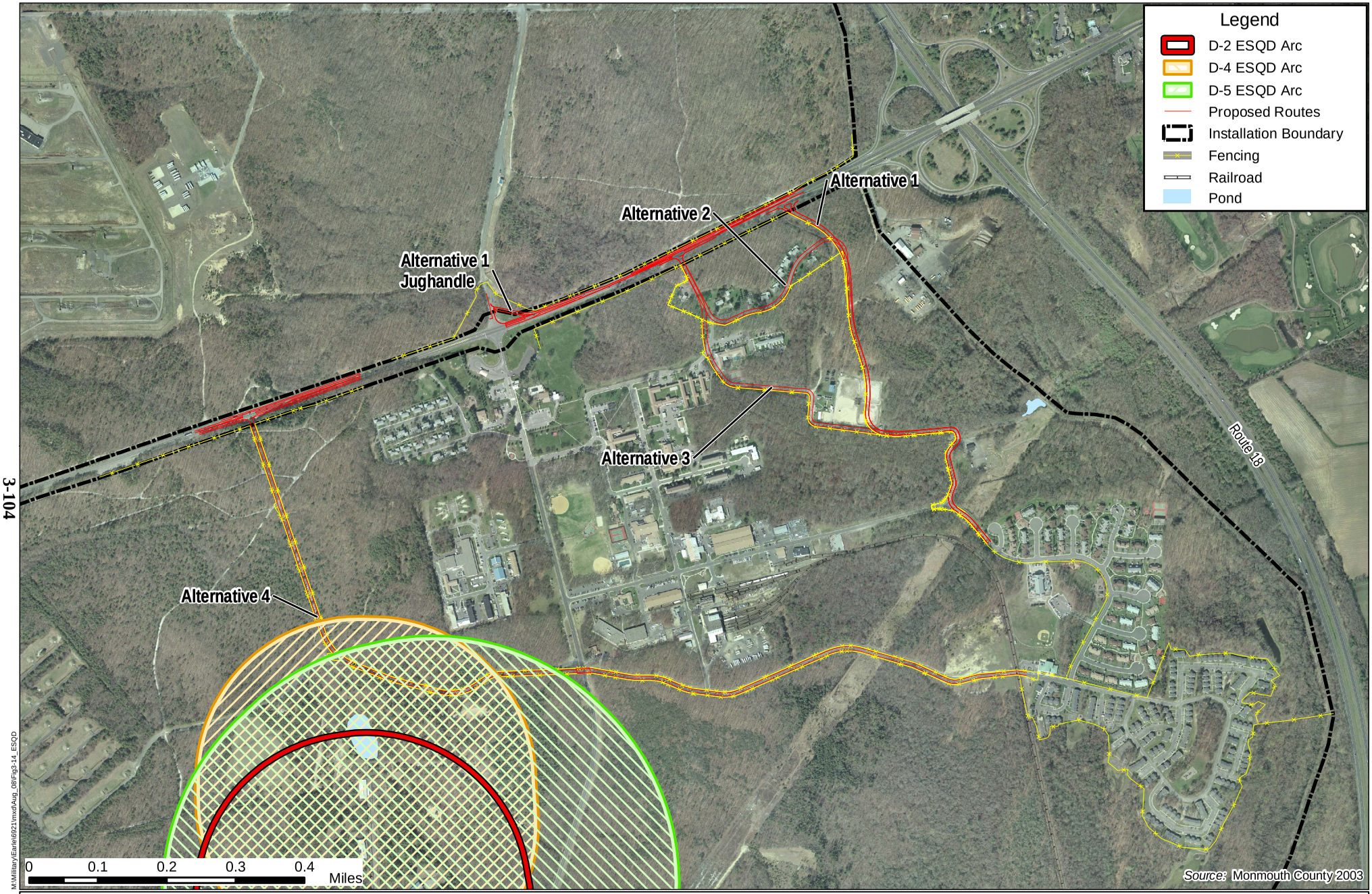
Construction of the landfill cap was completed in July of 1998. Post remediation groundwater monitoring is underway. The second 5-year review was completed in May 2008. Recommendations in the report suggested reducing the sampling frequency to 2-year intervals and reducing the analytical parameter list to specific volatile organic compounds and metals (Helms 2008).

3.12.3 Ordnance

It is the policy of the Department of the Navy to maintain an effective and aggressive ordnance safety program throughout the Department. Adherence to the instructions and regulations contained in the Naval Sea Systems Command Ordnance Pamphlet 5, Volume 1, Ammunition and Explosives Safety Ashore (U.S. Navy 2007g) provides a continuing, aggressive accident prevention program throughout all commands where military or civilian personnel are stationed or employed and ordnance equipment, ammunition, and explosives are used. Ordnance Pamphlet 5, Volume 1, addresses explosive safety quantity distance arcs and the required setbacks for facilities. Naval Weapons Station Earle fully adheres to the instructions and regulations contained in Ordnance Pamphlet 5, Volume 1. Housing areas are located outside of all explosive safety quantity distance arcs. Of the four alternative alignments, only Alternative Alignment 4 is encumbered by existing explosive safety quantity distance arcs. As illustrated on Figure 3-14, two arcs associated with the D-Group ordnance operations area encumber the portion of Alternative Alignment 4 between Lake Earle Road and Esperance Road. The remaining D-Group arc is located approximately 420 feet from Alternative Alignment 4.

3.12.4 Safety

Human health and safety issues associated with family housing are generally associated with traffic and the potential for accidents involving pedestrians and vehicles, as well as safety of children involving land uses within or adjacent to family housing. In the case of traffic safety, Section 3.5 did not identify any roads or intersections that are particular areas of concern. With respect to nearby land uses that could pose a threat to children, no particular issues have been identified. Where construction may occur, there is an increased safety risk—particularly to children. Examples include sedimentation ponds that are not properly secured, construction debris, and unsecured housing units that are under construction. Construction site health and safety issues at NWS Earle would be the responsibility of the contractor performing the work. Securing a construction site would generally be accomplished by fencing the perimeter of the work area.



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Figure 3-14
Explosive Safety Quantity Distance Arcs

3.12.5 Environmental Justice/Protection of Children

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed into law on 11 February 1994. The EO establishes environmental justice as a regulatory objective pertaining to the proportional distribution of adverse environmental effects that would be experienced by minority communities and low-income socioeconomic groups. In particular, environmental justice is achieved if low-income and minority communities are not subjected to disproportionately high or adverse environmental effects. In environmental justice analysis, minority populations and low-income populations are defined as follows.

- A minority represents the union between (not the sum of) minority race populations (Black or African American, American Indian and Alaska Native, Asian Alone, Native Hawaiian and Other Pacific Islander) and the Hispanic/Latino population (CEQ 1997). It includes those that reported some other race and two or more races and Whites of Hispanic/Latino origin.

- Minority populations are identified where either: (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population (CEQ 1997).

- Low-income populations are defined as areas where a greater percentage of persons are living below the poverty level than in the comparison population. Poverty statistics presented in U.S. Census Bureau publications use thresholds prescribed for federal agencies. The official definition uses 48 thresholds that take into account family size and the presence and number of family members under 18 years old. For the 2000 Census (which relies on 1999 income levels), the weighted average poverty threshold for a family of four is $17,029 (U.S. Census Bureau 2003b). This same threshold for 2006 is $20,614 (U.S. Census Bureau 2007u).

3.12.5.1 Minority Populations

An analysis of the racial and ethnic characteristics of the ROI reveals that neither Colts Neck nor Tinton Falls meets the aforementioned definitions of minority populations (see Table 3-4). However, it is notable that Census Tract 8099.33, encompassing all of the housing areas at NWS Earle, met the definition for a minority population based on the Census 2000 data. The 2000 census data represents a time period when occupancy rates at Laurelwood and other housing areas at NWS Earle were high. At that time, the total minority population in this census tract was 47.5 percent (including all minority races and all Hispanic and Latinos, but without double-counting of those Hispanic and Latinos also reporting race). By comparison, the total minority population of Colts Neck was 16.6 percent, Tinton Falls was 25.0 percent, Monmouth County was 19.4 percent, New Jersey was 34.0 percent, and U.S. was 30.9 percent. Black or African Americans alone comprised 32.3 percent of the population in this census tract. Those reporting

Hispanic or Latino Origin comprised 10.8 percent of the population in this census tract (U.S. Census Bureau 2007l).

3.12.5.2 Low-Income Population

An analysis of the poverty status of the ROI reveals that neither Colts Neck nor Tinton Falls meets the definition of a low- income population (see Table 3-10). Within Census Tract 8099.33, a total of 7.3 percent of the population fell below the poverty level in 2000. This is higher than the percentage in Colts Neck (2.8 percent), Tinton Falls (3.9 percent), and Monmouth County (6.3 percent), but lower than the percentage in New Jersey (8.5 percent) and the U.S. (12.4 percent) (U.S. Census Bureau 2007l).

Based on the above analysis, Census Tract 8099.33 is an environmental justice community. However, the following contextual information is important in the analysis of disproportionate adverse impacts to this population (discussed in Section 4.12.1.5):

- The racial diversity of the military service personnel and their dependents that occupy housing at NWS Earle residing within Census Tract 8099.33 is representative of the racial and ethnic diversity of the Armed Forces, which has higher rates of diversity than the general U.S. population.

- Communities comprised of military service personnel and their dependants living on an installation are generally not considered low-income as a number of their living expenses (housing, for example) are provided by the Government. Census Tract 8099.33 falls within the definition of low-income used in this analysis by virtue of the relative wealth of the surrounding community.

- Since the 2000 Census, the population of Census Tract 8099.33 is known to have decreased to approximately 20 percent of the 2000 population. Changes in racial/ethnic and income distribution in this census tract also have undoubtedly occurred, but the census is conducted on a decennial basis and interim estimates are not available at the census tract level.

- The proposed action would result in direct changes to the characteristics of this population.

3.12.5.3 Protection of Children

Executive Order 13045, Environmental Health Risks and Safety Risks to Children, which was signed by President Clinton on 21 April 1997, states:

> A growing body of scientific knowledge demonstrates that children may suffer disproportionately more environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in

proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each federal agency:

- shall make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children; and
- ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks and safety risks.

Under the definitions provided in EO 13045, covered regulatory actions include those that may be "economically significant" (under EO 12866) and "concern an environmental health risk and safety risk that an agency has reason to believe may disproportionately affect children." Further, EO 13045 defines environmental health risks and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to)."

Tables 1-3 and 1-4 show that there were 206 children (131 school-age and 75 non school-age) residing at NWS Earle in May 2007. These children resided in one of the four housing areas illustrated on Figure 1-2. Disproportionate populations of children may be located at any number of on-base recreational resources as well as the child development center and youth center located near the Stark Road and Laurelwood housing areas (labeled "Community Facilities" on Figure 2-1). Average daily enrollment at the child development center is approximately 40 children and the youth center typically has approximately 35 children present, depending on the particular programming and time of day (McCaffrey 2008).

3.13 SECURITY

Naval Weapons Station Earle maintains security using a multi-layered approach. This includes security personnel to enforce various laws and Navy regulations on the installation and the physical security structures and other facilities used in protecting the installation and its property.

3.13.1 Personnel Security

The NWS Earle Security Force consists of a combination of Active Duty Military Police, Civilian Police, and Civilian Guards totaling approximately 150 personnel. This force can be augmented by Naval Reserve Military Police and Auxiliary Security Force personnel should security needs dictate such an increase during certain operations or heightened security conditions.

The law enforcement on NWS Earle is typical of any military base. The police are responsible for routine traffic and parking control, and the response and investigation of criminal activity as

well as other issues that a domestic police force may encounter. The difference in enforcement is due to the installation's Exclusive Federal Jurisdiction. This type of jurisdiction requires the use of a Federal Magistrate to enforce state traffic and criminal laws under the Assimilative Crimes Act (18 U.S.C. § 13). The Federal Magistrate adjudicates all traffic, trespassing, and minor criminal infractions. For serious offenses that cannot be adjudicated by the magistrate, the offender is detained and transported to a federal detention facility in Trenton, New Jersey where the offender would be prosecuted by the U.S. Attorney.

Security personnel provide the various security functions required to protect the installation's facilities and personnel. These functions take the form of personnel maintaining inspection facilities used to check vehicles prior to allowing access to the installation. Security personnel man the installation Pass Office, other administrative facilities, various gates, and provide routine interior and perimeter patrols.

3.13.2 Physical Security

The physical security program is that part of security concerned with active and passive measures designed to prevent unauthorized access to personnel, equipment, installations, information, and to safeguard them against espionage, sabotage, terrorism, damage, and criminal activity. Physical security programs are designed for prevention and provide the means to counter threats when preventive measures are ignored or bypassed.

3.13.2.1 Applicable Policies and Standards

Department of Defense policies and minimum standards for the physical protection of DoD personnel, installations, operations, and related resources are contained in DoD Regulation 5200.08-R, Physical Security Program, April 9, 2007. Naval Weapons Station Earle is fully compliant with DoD Regulation 5200.08-R.

The Department of the Navy utilizes a number of regulations to establish and ensure implementation of uniform minimum law enforcement and security standards. The Office of the Chief of Naval Operations Instruction (OPNAVINST) 5530.14(series), Navy Physical Security and Law Enforcement Manual is the Navy's governing instruction. The policies therein pertain to preventing or mitigating hostile actions against personnel, resources, and facilities and therefore fall within the domain of security and law enforcement. Enclosure (1) of OPNAVINST 5530-14(series) addresses security and law enforcement policy for safeguarding personnel, property, and material and enforcing rules and regulations at Navy installations. Naval Weapons Station Earle Instruction (NWSEARLINST) 5510.1, Naval Weapons Station Earle Security Department Standard Operating Procedure, is a local instruction that implements OPNAVINST 5530.14(series) and provides the guidelines to safely and effectively operate the Security Department at NWS Earle. Its focus is effectively safeguarding personnel, protecting property, and responding to various incidents at NWS Earle by deterring, detecting and confronting acts of unauthorized access, espionage, sabotage, terrorism, and other unlawful events which reduce the capability of the command to perform its mission. In addition to these instructions, the Chief of

Naval Operations has also issued OPNAVINST 3300.53(series), Navy Antiterrorism Program. This instruction provides Navy antiterrorism policy, guidance, information, procedures and responsibilities for the protection of military personnel, civilian employees, family members, resources, facilities, and equipment on all ships, Navy aircraft, commands and installations against terrorist acts. This OPNAVINST requires that Commands establish an antiterrorism program tailored to the local mission, conditions and terrorist threat. To that end, NWS Earle developed NWSEARLINST 5530.5A, Naval Weapons Station Earle Physical Security and Antiterrorism/Force Protection Plan.

While the standards set forth in each of the documents referenced above are designed to provide a secure environment, Navy components maintain the authority to apply even more stringent standards as warranted. In addition to the dictates of each of the documents above, facilities safety is further enhanced by the Unified Facilities Criteria (UFC), which establish design guidelines for security fencing, gates, barriers and guard facilities (UFC 4-022-03); vehicle barriers (UFC 4-022-02); buildings (UFC 4-010-01); and access control points (UFC 4-022-01), among other facilities features. Together, these documents determine the minimum standards that govern law enforcement, safety and security at NWS Earle, and those standards will continue to be applicable if an access road to the Laurelwood housing area is constructed. Additionally, the Commander maintains the authority to implement further security measures as warranted. While this EIS can describe general measures that would be available, security concerns dictate that specific measures and methods of implementation not be disclosed.

In addition to the basic physical security policy, the DoD and Navy also provide guidance for ammunition and explosives control and storage. Department of Defense Manual 5100.76-M, Physical Security of Sensitive Conventional Arms, Ammunitions and Explosives (AA&E), issued by the Assistant Secretary of Defense, Command, Control Communications, and Intelligence, provides the minimum standards for the physical security of AA&E in the custody of any DoD Component, such as those AA&E stored at NWS Earle. The OPNAVINST 5530.13(series), Department of Navy Physical Security Instruction for Conventional Arms, Ammunition, and Explosives, is the Navy's governing instruction (derived from DoD Manual 5100.76-M) for the physical security of AA&E. Methods for securing AA&E as prescribed by DoD 5100.76-M and OPNAVINST 5530.13(series) include intrusion detection systems, security patrols, posting and key and lock control requirements, area entry control, structural and fencing requirements for storage facilities, and enhanced security lighting and communications equipment. They also prescribe policies, procedures and standards for transporting AA&E. Naval Sea Systems Command Ordnance Pamphlet 5, Volume 1, Ammunition and Explosives Safety Ashore, contains the Navy's instructions and regulations governing the handling, storing, preparation for shipment, production, renovation, surveillance, and maintenance of ammunition and explosives.

3.13.2.2 NWS Earle Physical Security Measures

Physical security planning is an important component of an installation's overall physical security program. In accordance with regulations and instructions described above, NWS Earle

considers the following elements in its planning for physical security. Implementation of specific elements is done on a case-by-case basis and is dependent on the type of asset to be safeguarded.

- Use of biometric, electronic and/or mechanical technological security systems to mitigate both vulnerability to the threat and reduce reliance on fixed security forces.
- Implementation of physical security programs to form the basis of integrated defense plans, which builds physical security into contingency, mobilization, antiterrorism, and wartime plans, and tests of physical security procedures and measures during the exercise of these plans.
- Coordinating physical security with operations activity, law enforcement, information security, personnel security, communications security, automated information security, counterintelligence and antiterrorism programs to provide an integrated and coherent effort.
- Training security forces and other personnel at the installation in defense against, and response to, unauthorized penetrations.
- Creating and sustaining physical security awareness training for all personnel.

The physical security program at NWS Earle employs physical protective and security procedural measures in combination with active or passive systems, technologies, devices, and security personnel used to protect assets from possible threats. Examples of measures that could be employed by NWS Earle include:

- security forces;
- military working dogs;
- physical barriers, facility hardening, and active delay or denial systems;
- secure locking systems, containers, and vaults;
- electronic security systems;
- assessment or surveillance systems (e.g., closed-circuit television, thermal imagers, millimeter wave, radar);
- protective lighting; and
- credential technologies, access control devices, biometrics, material or asset tagging systems, and contraband detection equipment.

Naval Weapons Station Earle is a secure facility and, therefore, specific details regarding the type of security features, facilities, and procedures in place cannot be discussed. However, the general nature of how physical security is handled is characterized below.

Access to the installation is gained through the main gate on Route 34, which is the primary entry point to the administrative area of the installation. In addition to the gate operations, all unaffiliated vehicles requiring access to the installation must undergo rigorous inspection at the vehicle inspection station. Access requirements for the Waterfront portion of the installation are identical. There are also several other gates into the station that are opened for specific purposes during specific events, (e.g., school bus operations or movement of material from mainside to Waterfront). The appropriate NWS Earle security personnel are present during these events.

Perimeter fences, gates, and guard facilities are in place and used primarily to define the perimeter of a restricted area, and to provide a physical and psychological deterrent to entry while serving notice that entry is not freely permitted. These facilities, in conjunction with personnel and procedures, are instrumental in preventing accidental entry, optimizing security force operations, and enhancing detection and apprehension, while directing and controlling the flow of personnel and vehicles through designated portals.

Naval Weapons Station Earle is surrounded by perimeter fencing that complies with accepted security standards for the installation. The administrative area of NWS Earle is divided by Route 34 which has fencing along each side. The Waterfront has fencing along its landward sides. Perimeter fencing is installed where required and in accordance with Navy guidance documents, in particular Unified Facilities Criteria 4-022-03, Security Engineering: Fences, Gates and Guard Facilities.

In addition to the exterior perimeter fence around NWS Earle, the Station utilizes other security measures throughout the facility. While specific security practices, equipment, and resources cannot be discussed, resources that are generally available to maintain security at military installations include the following: cameras, intrusion detection devices, secondary fencing, secured windows and doors, and secured entry points. The additional physical security is commensurate with the level of protection required for a specific facility within NWS Earle.

4 ENVIRONMENTAL CONSEQUENCES

4.1 LAND USE

Factors considered in evaluating land use impacts were:

- compatibility with existing land use;
- changes to on- or off-Station land use that could degrade the NWS Earle mission;
- consistency with the goals, objectives, or guidelines of the Colts Neck Township Master Plan.

4.1.1 Proposed Action

Potential impacts to land use vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

4.1.1.1 Alternative Alignment 1

Providing for unimpeded access to the Laurelwood housing area would result in minor changes to land use along Alternative Alignment 1. The alignment corridor land use would change to transportation/infrastructure. Under Alternative Alignment 1, the area that would be dedicated to unimpeded access would be 3,379 LF (the least of any alternative). The introduction of a jughandle at the intersection of Tarawa Road and Esperance Road would change the land use from open space to transportation infrastructure. The new entrance along Route 34 would be within the existing right-of-way and of little consequence. Establishment of a new, fenced access route as proposed under this alternative would largely expand on existing transportation infrastructure and changes to land use would be realized through the widening/upgrades to these routes, including security fencing. However, the route through the Green Drive housing area would be in proximity to the northernmost units in this housing area and this change in land use would negatively influence the relatively secluded residential land use character of this area. The establishment of the route across the wastewater treatment plant sand fields would result in a conversion of land use from the inactive sand field use to transportation and would result in minor changes in utility infrastructure with the relocation of the treated water outfall. The establishment of a new perimeter emergency access point where the route intersects with Saipan Road and at the intersection of the sand road and installation perimeter road north of the Laurelwood housing area would introduce a minor amount of land use dedicated to security.

The establishment of the fence line south of the Stark Road and Laurelwood housing areas would not affect existing community facility land use in this area. However, this fencing would require that residents of Stark Road housing area use the proposed unimpeded access route to access their housing. This would result in impaired access to some base community services as residents would be required to use the Main Gate to access on-base facilities. In particular, the two community facilities located adjacent to the Stark Road housing area would only be accessible

from on-base. Furthermore, under Alternatives 1, 2, and 3 the existing driveway for the community facility along Stark Road would be eliminated; only the community facility along Macassar Road would have access from on-base. If one of these alternatives is selected, the Navy would need to provide access to both facilities. Provision of this access is not part of the proposed action evaluated in this EIS. The Navy would comply with all applicable laws and regulations prior to implementing the community facility access.

There would not be changes to land use patterns at the Laurelwood housing area. As stipulated in the Outlease, Part I, paragraph D, page 2:

> "The sole purpose for which Lessee shall use the Leased Property, in the absence or prior written approval of the Government for any other use, is for the construction, operation and leasing of three hundred (300) units of residential housing. No additional structures may be constructed during the term of this Outlease unless specifically approved by the Government."

Land use at the Laurelwood housing area would continue to be inconsistent with the inapplicable zoning established by the Colts Neck Township.

4.1.1.2 Alternative Alignment 2

The impacts of Alternative Alignment 2 on land use would be the same as described for Alternative Alignment 1 with three exceptions. First, the amount of area dedicated to unimpeded access would be slightly greater as this route is 3,590 LF, or 211 LF greater than Alternative Alignment 1. Second, the access point along Route 34 would be further south and the proposed route would traverse the full length of Green Drive. This use would be compatible with existing land use; however, the increased traffic on the route could affect the relatively secluded residential land use character of this area. Third, the fencing of the route to the south of the existing road would require that residents of Green Drive and Stark Road housing areas use the proposed unimpeded access route to access their housing. This would result in impaired access to some base community services as residents would be required to use the Main Gate to access on-base facilities, including the two community facilities as described in Section 4.1.1.1. Pedestrian and bicycle access to mainside resources would be particularly impacted.

4.1.1.3 Alternative Alignment 3

The impacts of Alternative Alignment 3 to land use would be the same as described for Alternative Alignment 1 for those areas north of the wastewater treatment plant sand fields. The proposed intersection with Route 34 would be the same as Alternative 2 (within the existing right-of-way for this highway). However, under Alternative 3, the proposed route through Green Drive housing area would be to the south of most of the existing units along Green Drive and at an increased distance as compared to Alternative Alignment 1. Therefore, the potential for minor impacts to the secluded residential land use character of the Green Drive housing area would be less under this alternative than under Alternative Alignments 1 and 2. Existing routes that would be used for unimpeded access under this alternative are on more established/paved routes than those proposed for Alternative Alignments 1 and 2, resulting in less change in the land use

character of these routes. Alternative Alignment 3 would not traverse the wastewater treatment plant sand fields; therefore, there would be no conversion of land use at this location.

As with Alternative Alignment 2, there would be impaired access to some base community services for the Green Drive and Stark Road housing areas, including the two community facilities as described in Section 4.1.1.1. In addition, under Alternative Alignment 3, Buildings C-27 (Transient Lodge), C-4 (Windjammer Club), and the NWS Earle wastewater treatment plant would be located north of the fence line. In terms of land use functionality, these facilities would be inappropriately separated from the administrative and support facilities, particularly for bicycle and pedestrian access. The magnitude of impacts to the Windjammer Club is lessened in that the facility is not fully active, but is used periodically (McCaffery 2007b).

The land use dedicated to unimpeded access would be greater, as the total route would be 3,960 feet, which is 370 feet more than Alternative Alignment 2 and 581 feet more than Alternative Alignment 1.

4.1.1.4 Alternative Alignment 4

Alternative Alignment 4 would result in the greatest LF dedicated to unimpeded access. Under this alternative, the route would total 7,181 LF (3,802 LF more than Alternative Alignment 1; 3,591 LF or twice as long as Alternative Alignment 2; and 3,221 LF more than Alternative Alignment 3). Given the separation of this route from developed land uses at the installation, there would be few impacts to existing land use under Alternative Alignment 4. The proposed five new perimeter emergency access points along the route would result in minor changes in land use at these distinct locations (see Figure 2-5). Alternative 4 requires the establishment of a new access road within the Stark Road housing area to access the community facility along Macassar Road because the new fence around Laurelwood would block the current entry point to that community facility. Provision of this access is not part of the proposed action evaluated in this EIS. The Navy would comply with all applicable laws and regulations prior to implementing community facility access. Fencing the Laurelwood housing area perimeter would be compatible with existing land use.

4.1.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. No changes to land use would occur; therefore, there would be no impacts to land use.

4.1.3 Coastal Zone Management

Mainside at NWS Earle is located entirely outside of New Jersey's coastal zone as defined by CAFRA. Actions proposed within the installation with potential spillover effects to the coastal zone must be coordinated with the state to assure consistency with the approved enforceable policies of the CZMP. Implementing any of the proposed alternative alignments would not result in any spill-over impacts into the coastal zone. Because there are no direct, indirect, or spill-over impacts to the coastal zone, the station has no requirements to consult under CZMA.

4.1.4 Summary of Impacts

Implementing Alternative Alignments 1, 2, or 3 would result in minor effects to land use at the Green Drive and Stark Road housing areas. Functionality would decrease relative to the other portions of the base. Furthermore, the secluded, residential land use character of the Green Drive community would be affected. Potential mitigation to offset the minor effect at Green Drive could involve planting screening vegetation, with a preference given to native vegetation when possible, to create a natural barrier between the new road and existing housing units. Under Alternative Alignment 3, Buildings C-27, C-4, and the wastewater treatment plant would be located outside the fence line, reducing their functionality with the administrative and support facilities at mainside. The minor effect to Green Drive and Stark Road housing areas and Buildings C-27, C-4, and the wastewater treatment facility due to a decrease of functionality could not be mitigated. No appreciable effects are anticipated from Alternative Alignment 4.

No impacts to land use would occur under the No Action Alternative.

4.2 SOCIOECONOMICS

Factors considered in evaluating impacts of the proposed action and alternatives include direct and indirect economic impacts, changes in demographics, community cohesion and interaction, and tax implications.

4.2.1 Proposed Action

Potential impacts to socioeconomics vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

4.2.1.1 Alternative Alignment 1

Economic Impacts

The construction activity associated with the development of unimpeded access to the Laurelwood housing area would result in a short-term influx of jobs and expenditures in the area. The economic impact of this activity was measured using an input-output economic model, Impact Analysis for Planning (IMPLAN) Professional® 2.0 (Minnesota IMPLAN Group 2004a). IMPLAN Professional® 2.0 is an economic impact assessment software system developed by Minnesota IMPLAN Group, Inc. as an outgrowth of the work of the group's founders at the University of Minnesota starting in 1984. The IMPLAN Model is a flexible and detailed input-output impact model system used throughout the U.S. It contains a set of multipliers that are used to evaluate “ripple effects” caused by increasing or decreasing spending in various parts of the economy. The model is built in the software system using specific IMPLAN data files for the region (in this case, Monmouth County). This regional data is derived from data bases of federal agencies, such as the U.S. Bureau of Economic Analysis (Minnesota IMPLAN Group 2004b). Inputs to the model, in this case, were the estimated expenditures associated with the

development of the unimpeded access road. These expenditures were input into the model in the economic sector associated with road construction and related improvements.

The output of the economic model quantifies the total combined economic impact in terms of direct, indirect, and induced effects. Direct effects relate to the predicted expenditure of dollars, in this case for construction of unimpeded access. An indirect effect includes the inter-industry effects predicted in response to the expenditures (i.e., construction contractors' expenditures in the local economy on such things as supplies, food, furnishings, and other merchandise and various services). An induced effect is a change in household spending in response to the expenditures. These impacts are categorized as total industry output, employment, and value added. Industry output represents how the construction of the unimpeded access changes the value of total production. Employment represents a total number of all jobs: full- and part-time, wage and salary. Value-added includes labor income (employee compensation plus proprietor's income), other property type income (rent, dividends, interest, profits), and indirect business taxes (taxes collected by businesses on behalf of government) (Minnesota IMPLAN Group 2004b).

The estimated cost of implementing unimpeded access for Alternative Alignment 1 would be approximately $4.697 million, including site clearing, installation of traffic improvements, fencing, gates, new roadway infrastructure, and final landscaping/stabilization (U.S. Navy 2008e). IMPLAN was used to estimate the economic impacts related to spending in the road construction economic sector.

The results of the modeling, shown in Table 4-1, indicate that the total regional economic impact of Alternative Alignment 1 would be $7.126 million in industry output, an estimated total of 50.2 full- or part-time wage or salary jobs, and $4.182 million in value-added economic impact. These impacts are estimated to occur primarily within the road-building sector, where the direct impacts would occur. The majority of the value-added economic gain ($3.101 million) is estimated in labor income, other property type income is estimated at $0.903 million, and indirect business taxes are estimated at $0.178 million. The economic gain, estimated by the IMPLAN model, would be a one-time regional economic gain primarily limited to the duration of the period of construction of the proposed unimpeded access. Once the funds used for construction are no longer circulating through the regional economy due to leakages such as savings, payment of taxes, or purchases of goods and services outside the region, the economic gains would no longer be realized.

The indirect and induced impacts would be realized in a variety of economic sectors, particularly wholesale trade, utilities, food and beverage stores, general merchandise stores, and truck transportation.

Table 4-1 Estimated Regional Economic Impacts of Alternatives

	Direct	Indirect	Induced	Total
Alternative Alignment 1				
Industry Output*	$4,697,870	$795,586	$1,632,603	$7,126,059
Employment (jobs)	32.5	4.9	12.8	50.2
Value Added*	$2,721,216	$417,615	$1,043,692	$4,182,523
Alternative Alignment 2				
Industry Output*	$5,751,020	$973,938	$1,998,594	$8,723,551
Employment (jobs)	39.8	6.0	15.6	61.5
Value Added*	$3,331,247	$511,235	$1,277,662	$5,120,144
Alternative Alignment 3				
Industry Output*	$4,278,778	$724,613	$1,486,960	$6,490,351
Employment (jobs)	29.6	4.5	11.6	45.7
Value Added*	$2,478,459	$380,360	$950,585	$3,809,404
Alternative Alignment 4				
Industry Output*	$10,816,185	$1,831,725	$3,758,839	$16,406,749
Employment (jobs)	74.9	11.3	29.4	115.6
Value Added*	$6,265,217	$961,501	$2,402,953	$9,629,671

Note: *Estimates are in 2008 dollars.

In addition to the construction activity associated with the development of unimpeded access, the developer would be expected to experience an increase in short-term periodic expenditures for operation and maintenance of the units, due to their increasing age and in order to prepare them for occupancy. The developer has indicated that each unit would be refurbished prior to rental. Exterior refurbishments would include new siding, roofing, landscaping, and street and sidewalk paving. Interior refurbishments would include new kitchens (including a new refrigerator, gas stove, dishwasher, sink, countertops, and garbage disposal) and bathrooms as well as new carpets, flooring, and paint (Laurelwood Homes LLC. 2008). The developer may hire and retain management and maintenance employees or contract out such services, resulting in a minor long-term employment impact. Over the term of the out-lease period, the developer would collect income from renters.

During the out-lease period, the civilian residents of the Laurelwood housing area would purchase goods and services in the community at a greater rate than military personnel and dependents had during the in-lease period. This is because (1) the occupancy rate of Laurelwood housing is currently at 3 percent and (2) the Navy community support and services, such as Navy Exchange, would not be available to the civilian residents of the Laurelwood housing area. It would be too speculative to quantitatively estimate these impacts, but modest gains would be expected for nearby retailers and services purveyors (e.g., convenience, grocery, retail stores, automobile service, etc.).

Given the interrelationship of the economics of the area with the greater New York Consolidated Metropolitan Statistical Area, civilian residents of the Laurelwood housing area would likely have and retain existing jobs rather than relocating and searching for available jobs locally. No discernible change in distribution of employment and income by economic impact would be expected as a result of the proposed action.

During the out-lease period, housing occupancy rates in Colts Neck Township would increase by an estimated 8 percent, assuming 100 percent occupancy of the Laurelwood housing area and no great change in the overall number of housing units in the Colts Neck Township as reported in the 2000 Census (see Table 3-12). Overall, this change is not expected to be dramatically different than the conditions during the 2000 Census (see Table 3-12) given that the available occupancy levels from the 2000 Census represent a time when the Laurelwood housing area occupancy rates were higher than they are today. Similarly, the proportion of occupied housing units in structures and number of bedrooms per unit for Colts Neck Township would be similar to 2000 Census levels (Tables 3-13 and 3-14, respectively).

The developer has indicated that they intend to market the Laurelwood units as Class A units after the refurbishments are completed. Based on the developer's marketplace survey, The Avalon apartment units in Freehold, New Jersey represent comparable intended rental rates (Laurelwood Homes LLC. 2008). The monthly rents for The Avalon apartment units range from $1,590 to $2,145 per month, with the average currently being $1,670 per month. The Avalon contains six types of housing units: 1-bedroom/1-bathroom, 1-bedroom/1-bathroom with loft, 2-bedroom/1-bathroom, 2-bedroom/2-bathroom, 2-bedroom/2-bathroom with loft, and 3-bedroom/2-bathroom. The most common unit leased by The Avalon is the 2-bedroom/2-bathroom unit. Currently, The Avalon has a 97 percent occupancy rate and has maintained that rate for over a year (Santos 2008). These rental rates would be in line with the average community townhouse costs in the NWS Earle vicinity as estimated by CNIC (see Table 3-15).

The civilian occupation of the Laurelwood housing area has the potential to have a minor influence on housing construction trends in the NWS Earle vicinity. During the out-lease period, Laurelwood housing would provide 300 units of housing and, therefore, lessen the need for new construction to meet community demand for multi-family housing. These 300 units would continue to be part of the local housing stock constructed in the 1980s (see Table 3-16).

Demographics

As presented in Table 4-2, assuming 100 percent occupancy, the future total population of the Laurelwood housing area would be a maximum of 853 persons. This would represent a 7.4 percent increase from the 2006 population of Colts Neck and would be almost the same as the 2000 population of Colts Neck, when occupancy rates at the Laurelwood housing area peaked. Although a similar population has been present at the Laurelwood housing area in the past, a different set of factors would contribute to the demographics of this population since the residents would be civilians rather than military personnel and their dependents. Given the relative stability of the Colts Neck population, this influx would not result in secondary changes in demographics or residency.

Migration to occupy vacant units at the Laurelwood housing area would be expected to come from both within and outside of Monmouth County and be influenced by factors such as proximity of the housing area to jobs, community facilities and services, and other attractions, as well as rental rates and other variables affecting individual decisions. The specifics on race and

ethnicity, place of work, and level of educational attainment cannot be predicted; however, it is reasonable to assume that the characteristics would be similar to Monmouth County as a whole (see Tables 3-4, 3-6, and 3-7).

Table 4-2 Future Conditions for Laurelwood Housing Area During Out-lease Period

Housing Type	Number of Units	Total Population		Total School-Age Children	
		Low Value	*High Value*	*Low Value*	*High Value*
Single-Family Attached (2 Bedroom Unit)[1]	204	436	501	52	67
Single-Family Attached (3 Bedroom Unit)[1]	60	128	147	15	20
Single-Family Attached (4 Bedroom Unit)[2]	36	119	205	29	58
Totals	**300**	**683**	**853**	**96**	**145**

Sources: U.S. Census Bureau 2003; Center for Urban Policy Research 2006

[1]The following multipliers were used for single-family attached 2-3 bedroom unit in central New Jersey (all housing unit values): Total Population (Low = 2.136, High = 2.456); Total School-Age Children (Low = 0.256, High = 0.328). "Low" and "High" values represent the 90% confidence interval for this housing type.

[2]The following multipliers were used for single-family attached 4-5 bedroom unit in central New Jersey (all housing unit values): Total Population (Low = 3.306, High = 5.689); Total School-Age Children (Low = 0.818, High = 1.602). "Low" and "High" values represent the 90% confidence interval for this housing type.

Notes:

--Multipliers derived from Census 2000, 5 Percent Public Use Microdata Sample and are based on the data set for Central New Jersey, which includes the counties of Hunterdon, Mercer, Middlesex, Monmouth, Ocean, and Somerset.

--Estimates assume 100% occupancy.

Community Cohesion and Interaction

Civilians residing at the Laurelwood housing area would be adjacent to military families living in the Stark Road housing area under Alternative Alignments 1, 2, and 3. Under Alternative Alignment 4, civilians residing in Laurelwood would be segregated from Stark Road by fencing. Civilian residents would interact with others living and working at NWS Earle, as well as other citizens of Colts Neck and Tinton Falls. The social values of the civilian residents would likely differ from those of a military housing community, but it is unknown to what extent. Military housing communities are unique in their cohesiveness built by the commonality of experience with one or more family members being in the service, use of on-station community support facilities, and participation in military family activities and events. The civilian Laurelwood housing area residents would likely have less community cohesion and interaction, at least initially. If renters become long-term renters, however, there could be a different type of community cohesion built through long-term residence in the area, a quality that many military communities are lacking.

Due to their proximity, there would be new interactions among civilian and military families, particularly those at Stark Road housing area under Alternative Alignments 1, 2, and 3. There could be quality of life impacts for new residents of the Laurelwood housing area, NWS Earle, Colts Neck, and Tinton Falls.

Tax Implications

Unless additional funding is allocated for Federal Impact Aid, funding for schools would be through state and local taxes. Given all of the factors that would affect tax rates, the magnitude of tax implications cannot be reasonably foreseen.

4.2.1.2 Alternative Alignment 2

The socioeconomic impacts of Alternative Alignment 2 would be the same as described for Alternative Alignment 1, with the exception that there would potentially be greater quality of life impacts to Green Drive housing area residents with this alignment. The establishment of the unimpeded access route in proximity to these units would have traffic and noise implications and would require residents to access services at mainside through the Main Gate, requiring more travel distance than under current conditions.

The estimated cost of implementing unimpeded access for Alternative Alignment 2 would be approximately $5.751 million, including site clearing, installation of traffic improvements, fencing, gates, new roadway infrastructure, and final landscaping/stabilization (U.S. Navy 2008e). As with the other alternatives, IMPLAN was used to estimate the direct, indirect, and induced economic impacts related to the spending for this alternative.

The results of the modeling, shown in Table 4-1, indicate that under Alternative Alignment 2, the total regional estimated economic gain would be $8.723 million in industry output, 61.5 jobs, and $5.120 million in value added. As with all alternatives, this would be a one-time regional economic gain primarily limited to the duration of the period of construction; direct impacts would primarily occur within the road-building economic sector; and the indirect and induced impacts would be realized in a variety of economic sectors (particularly wholesale trade, utilities, food and beverage stores, general merchandise stores, and truck transportation). The majority of the value-added economic gain ($3.796 million) is estimated in labor income; other property type income is estimated at $1.106 million; and indirect business taxes are estimated at $0.218 million.

4.2.1.3 Alternative Alignment 3

As with Alternative Alignment 2, the socioeconomic impacts of Alternative Alignment 3 would be the same as described for Alternative 1 with the exception of Green Drive housing area. Under Alternative Alignment 3, the proposed route for unimpeded access would be further removed from the majority of housing units on Green Drive and, therefore, would have fewer quality of life impacts. However, as with Alternative Alignment 2, residents of Green Drive housing area would be required to access services at mainside through the Main Gate requiring more travel distance than under current conditions.

The estimated cost of implementing unimpeded access for Alternative Alignment 3 would be approximately $4.278 million (U.S. Navy 2008e); the least expense of any alternative. This is due to lower roadway work costs as much of this route would be on established roadways. As

with the other alternatives, IMPLAN was used to estimate the direct, indirect, and induced economic impacts related to the spending for this alternative.

The results of the modeling, shown in Table 4-1, indicate that the total regional economic impact of Alternative Alignment 3 would be $6.490 million in industry output, an estimated total of 45.7 in jobs, and $3.809 million in value added. As with all the alternatives, this would be a one-time regional economic gain primarily limited to the duration of the period of construction; direct impacts would primarily occur within the road-building economic sector; and the indirect and induced impacts would be realized in a variety of economic sectors, particularly wholesale trade, utilities, food and beverage stores, general merchandise stores, and truck transportation. The majority of the value-added economic gain ($2.825 million) is estimated in labor income; other property type income is estimated at $0.823 million; and indirect business taxes are estimated at $0.162 million.

4.2.1.4 Alternative Alignment 4

The socioeconomic impacts of Alternative Alignment 4 would be similar to those described for Alternative Alignment 1. However, the location of the unimpeded access and fencing would have fewer impacts to current NWS Earle residents. The fencing of the Laurelwood housing area perimeter would create a barrier between Laurelwood and Stark Road housing areas and isolate those in the Laurelwood housing area from all other areas at NWS Earle. Therefore, there likely would be minimal interaction between the residents of Laurelwood and other NWS Earle residents.

The estimated cost of implementing unimpeded access for Alternative Alignment 4 would be approximately $10.816 million (U.S. Navy 2008e); the most costly of any alternative. This is primarily due to increased roadway work, the new bridge over Esperance Road, and fencing that would be a greater length under this alternative. As with the other alternatives, IMPLAN was used to estimate the direct, indirect, and induced economic impacts related to the spending for this alternative.

The results of the modeling, shown in Table 4-1, indicate that the total regional economic impact of Alternative Alignment 4 would be a gain of $16.406 million in industry output, 115.6 jobs, and $9.629 million in value added. As with all the alternatives, this would be a one-time regional economic gain primarily limited to the duration of the period of construction; direct impacts would primarily occur within the road-building economic sector; and the indirect and induced impacts would be realized in a variety of economic sectors, particularly wholesale trade, utilities, food and beverage stores, general merchandise stores, and truck transportation. The majority of the value-added economic gain ($7.140 million) is estimated in labor income; other property type income is estimated at $2.079 million; and indirect business taxes are estimated at $0.410 million.

4.2.2 No Action Alternative

Under the No Action Alternative, changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The Navy would be in breach of the lease agreement if unimpeded access is not provided at the termination of the in-lease period. Under this circumstance, the Navy would terminate the lease and compensate the developer in an amount equal to the developer's right to use or occupy the Laurelwood housing area for what would have been the remaining useful life of the housing. No changes to demographics, the community, and local taxes would occur.

4.2.3 Summary of Impacts

The construction activity associated with the development of unimpeded access to the Laurelwood housing area would result in a short-term and temporary influx of jobs and expenditures in the area. The total regional economic impact of Alternative Alignment 1 would be $7.126 million in industry output, an estimated total of 50.2 full- or part-time temporary wage or salary jobs, and $4.182 million in value-added economic impact. The total regional economic impact of Alternative Alignment 2 would be $8.723 million in industry output, an estimated total of 61.5 full- or part-time temporary wage or salary jobs, and $5.120 million in value-added economic impact. The total regional economic impact of Alternative Alignment 3 would be $6.490 million in industry output, an estimated total of 45.7 full- or part-time temporary wage or salary jobs, and $3.809 million in value-added economic impact. The total regional economic impact of Alternative Alignment 4 would be $16.406 million in industry output, an estimated total of 115.6 full- or part-time temporary wage or salary jobs, and $9.629 million in value-added economic impact (Minnesota IMPLAN Group 2004a).

Over the long term, civilian residents of Laurelwood would purchase goods and services in the community, resulting in beneficial impacts to nearby retailers and services purveyors. Under the proposed action, the Laurelwood housing area population (assuming 100% occupancy) would represent a 7.4 percent increase in the 2006 Colts Neck Township population. It is expected that some future residents of Laurelwood may already be located in Colts Neck. Given the relative stability of the Colts Neck population, this influx would not result in secondary changes in demographics or residency.

Civilians residing at the Laurelwood housing area would be adjacent to military families living in the Stark Road housing area under Alternative Alignments 1, 2, and 3. Civilian residents would interact with others living and working at NWS Earle, as well as other citizens of Colts Neck and Tinton Falls. The social values of the civilian residents would likely differ from those of a military housing community, but it is unknown to what extent. Military housing communities are unique in their cohesiveness built by the commonality of experience with one or more family members being in the service, use of on-station community support facilities, and participation in military family activities and events. The civilian Laurelwood housing area residents would likely have less community cohesion and interaction, at least initially. If renters become long-term renters, however, there could be a different type of community cohesion built through long-

term residence in the area, a quality that many military communities are lacking. Due to their proximity, there would be new interactions among civilian and military families, particularly those at Stark Road housing area under Alternative Alignments 1, 2, and 3. There could be quality of life impacts for new residents of the Laurelwood housing area, NWS Earle, Colts Neck, and Tinton Falls.

No impacts to socioeconomics would occur under the No Action Alternative.

4.3 COMMUNITY FACILITIES AND SERVICES

Factors considered in the evaluation of impacts include infrastructure and capacity of education, police, fire, medical services, and recreation to accommodate the changes that would result from the implementation of the proposed action and alternatives. As currently vacant units at the Laurelwood housing area are occupied, the population served by various community facilities and services at NWS Earle and the surrounding community would increase. Impacts of population increases are estimated within the context that the estimated future population of the housing area, which is detailed in Table 4-2, would be at 853 if fully occupied. These conditions would be similar to the population at the housing area when it was almost fully occupied as recently as 2000.

4.3.1 Education

4.3.1.1 Proposed Action

The on-station Child Development and Youth centers would not be impacted by the re-occupation of the Laurelwood housing area during the out-lease period with civilians rather than military personnel, as these centers service military dependents and would not serve children of civilians at the Laurelwood housing area. Off-station childcare facilities would likely be impacted by increased demand for services in the local area. The industry would be expected to have adequate resources to respond to this demand over the long term, although there may be some lag-time during which there may be waiting lists and inadequate capacity at existing facilities to meet the demand.

Table 4-3 presents the estimated total school-age children and total public school children that would potentially reside at the Laurelwood housing area during the out-lease period (under full occupancy conditions). School-age children include household members of elementary and secondary school (kindergarten through Grade 12) age. Public school children are those school-age children that attend public school. These estimates are based on the collection of *residential multipliers* published by The Center for Urban Policy Research at Rutgers University (Center for Urban Policy Research 2006), first introduced in Section 2.2 of this EIS. The "Low" and "High" values represent the 90 percent confidence interval for each housing type (i.e., the estimate has a 90 percent probably of containing the true population value). The impact analysis is based on the high value.

Based on this analysis, there would be up to 145 school-age children that would reside at Laurelwood during the out-lease period and, of those, up to 100 would attend public schools. However, the level of uncertainty with regard to the multipliers for total public school children associated with 4-5 bedroom units is notable. The error margin is 48 percent, which nears the threshold that statisticians prefer (an error margin of 50 percent or less). This is due to the relatively low sample size for 4-5 bedroom single-family attached housing units [(1,510 units as compared to 25,154 units for the 2-3 bedroom single family attached housing units] Center for Urban Policy Research 2006). Several comments received on the DEIS questioned the estimate that up to 45 school-age children would not attend public schools (see Table 4-3) but would instead attend a private school or be home schooled. Therefore, for the purpose of this impact analysis, it is assumed that the high value of 145 school-age children estimated in Table 4-3 would all attend public schools.

Regardless of implementation of the proposed action, under the PPV initiative the Navy would transfer the Green Acres housing area and underlying land to the PPV entity. School-age children residing in Green Acres would attend public schools in the Colts Neck School District. Implementation of this PPV initiative at NWS Earle has already been evaluated under separate NEPA documentation (U.S. Navy 2004a). Assuming 100 percent occupancy, the remaining Navy-occupied housing areas (Green Drive and Stark Road) would be occupied at levels very similar to the May 2007 levels for Navy-occupied housing in the future under the proposed action (total population of 383 under the proposed action compared to a total population of 390 in 2007). Whereas the May 2007 school-age population in Navy-occupied housing areas was 116, the total future estimated school-age children in Navy-occupied housing areas is 127 (again, assuming 100 percent occupancy) (see Tables 1-3 and 1-5).

This future estimate of school-age children in the Navy-occupied housing areas is based on the existing distribution of school-age children in Navy-occupied housing at NWS Earle. These school-age children of Navy personnel would be additive to the high value estimate of 145 school-age children at the Laurelwood housing area during the out-lease period (see Table 4-3). Therefore, the total school-age children at NWS Earle under the proposed action would be up to 272 as compared to the baseline total of 142 school-age children at NWS Earle in Laurelwood, Stark Road and Green Drive housing areas combined. (See Tables 1-4 and 1-5).

The Center for Urban Policy Research at Rutgers University (Center for Urban Policy Research 2006) also includes *residential multipliers* that estimated the distribution of public school children in the following grade groups: elementary (Kindergarten–Grade 6), junior high school (Grades 7–9), and high school (Grades 10–12). These multipliers are for the total public school children only (and, unlike the total school-age children and total public school children multipliers, do not include a high and low, 90 percent confidence interval). The number estimated for total public school children is essentially the middle point between the low and high numbers in Table 4-3 above. Table 4-4 presents the results of this analysis of public school grade distribution for the Laurelwood housing area during the out-lease period based on these multipliers. According to this estimate, the majority (58.5 percent) of the public school children

would be Kindergarten to Grade 6; 25.6 percent would be Grades 7 to 9; and 15.9 percent would be Grades 10 to12.

Table 4-3 Estimated Total School-Age Children and Total Public School Children at Laurelwood Housing Area during the Out-lease Period

Housing Type	Number of Units	Total School-Age Children		Total Public School Children	
		Low Value	*High Value*	*Low Value*	*High Value*
Single-Family Attached (2 Bedroom Unit)[1]	204	52	67	44	59
Single-Family Attached (3 Bedroom Unit)[1]	60	15	20	13	17
Single-Family Attached (4 Bedroom Unit)[2]	36	29	58	8	24
Totals	**300**	**96**	**145**	**65**	**100**

Sources: U.S. Census Bureau 2003; Center for Urban Policy Research 2006

[1]The following multipliers were used for single-family attached 2-3 bedroom unit in central New Jersey (all housing unit values): Total School-Age Children (Low = 0.256, High = 0.328) and Total Public School Children (Low=0.214, High = 0.233). "Low" and "High" values represent the 90 percent confidence interval for this housing type. The error margin as percentage for Total School-Age Children is 12 percent and the error margin as percentage for Total Public School Children is 15 percent. The sample size used in development of both multipliers was 25,154 (central region of New Jersey).

[2]The following multipliers were used for single-family attached 4-5 bedroom unit in central New Jersey (all housing unit values): Total School-Age Children (Low = 0.818, High = 1.602) and Total Public School Children. (Low = 0.449, High = 0.663). "Low" and "High" values represent the 90 percent confidence interval for this housing type. The error margin as percentage for Total School-Age Children is 15 percent and the error margin as percentage for Total Public School Children is 48 percent. Statisticians prefer an error margin as percentage of 50 percent or less; the error margin for Total Public School Children nears this 50 percent mark. The sample size used in development of both multipliers was 1,510 (Center for Urban Policy and Research 2006).

Notes:

--Multipliers are derived from Census 2000, 5 Percent Public Use Microdata Sample and are based on data set for Central New Jersey, which includes the counties of Hunterdon, Mercer, Middlesex, Monmouth, Ocean, and Somerset.

--Estimates assume 100 percent occupancy.

The by-grade breakdowns provided by the multipliers do not match up with the grade levels in potentially affected schools: Mahala F. Atchison Elementary School (Pre-K to Grade 3), Swimming River Elementary School Grade (Grades 4-5), Tinton Falls Middle School (Grades 6-8), and Monmouth Regional High School (Grades 9-12). However, they are useful in providing a representation that the majority of impacts would occur at the elementary/middle school level.

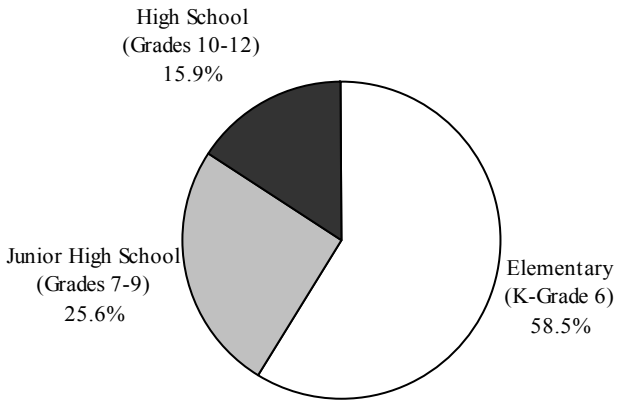
The increased enrollment from residents of the Laurelwood housing area during the out-lease period would result in significant impacts at Mahala F. Atchison Elementary School (Pre-K to Grade 3). While the most recent enrollment levels (2007-2008) are lower than previous years, this school has been experiencing increasing enrollment levels, is already exceeding average class size recommendations of the NJDOE and physical capacity, has higher average class sizes than the state, and has a higher average student-faculty ratio than the state. The number of students estimated in the Pre-K to Grade 3 category under the proposed action would potentially equate to one or two additional classes for this school. The existing Long-Range Facility Infrastructure Plan for the school does not provide for the capacity to accommodate this impact.

Therefore, the physical capacity of Mahala F. Atchison Elementary School would be further exceeded and additional faculty would need to be hired.

Table 4-4 Estimated Public School Children by Grade at Laurelwood Housing Area during the Out-lease Period

Housing Type	Number of Units	Total Public School Children	Public School Grade		
			Elementary (K - Grade 6)	*Junior High School (Grades 7-9)*	*High School (Grades 10-12)*
Single-Family Attached (2 Bedroom Unit)[1]	204	51	30	14	7
Single-Family Attached (3 Bedroom Unit)[1]	60	15	9	4	2
Single-Family Attached (4 Bedroom Unit)[2]	36	16	9	3	4
Totals	**300**	**82**	**48**	**21**	**13**

Graphical Representation



Sources: U.S. Census Bureau 2003; Center for Urban Policy Research 2006

[1]The following multipliers were used for single-family attached 2-3 bedroom unit in central New Jersey (all housing unit values): Total Public School Children (0.251), Elementary (0.146), Junior High School (0.071), and High School (0.033).

[2]The following multipliers were used for single-family attached 4-5 bedroom unit in central New Jersey (all housing unit values): Total Public School Children. (0.449), Elementary (0.256), Junior High School (0.095), and High School (0.101)

Notes:

--Multipliers are derived from Census 2000, 5 Percent Public Use Microdata Sample and are based on data set for Central New Jersey, which includes the counties of Hunterdon, Mercer, Middlesex, Monmouth, Ocean, and Somerset.

--Estimates assume 100 percent occupancy.

Impacts to Swimming River Elementary School Grade (Grades 4-5) and Tinton Falls Middle School (Grades 6-8) would also be potentially significant. Both schools are currently overcrowded (Sydney-Gens 2008), despite the decline in their combined enrollment since the 2004-2005 school year. Given the estimated public school children by-grade analysis and that the existing class sizes at Swimming River Elementary exceed the state averages (but not the NJDOE recommended class size), impacts to Swimming River Elementary School would potentially require the hiring of additional faculty and/or exceed the school's physical capacity. Impacts to Swimming River Elementary School would also vary depending on any action that

Tinton Falls School District takes to move students from Mahala F. Atchison Elementary School to Swimming River Elementary School.

The impact of the proposed action on Monmouth Regional High School enrollment and capacity, however, would be minimal. This assessment is based on the existing capacity of 1,500 students; current enrollment of less than 1,200 students; current average class size less than NJDOE recommendations; and current student/faculty ratio lower than the statewide ratio. Applying the relative percentages of students by grade provided in the pie chart in Table 4-4 to the potential 145 school-age children results in an increase of about 23 students to the Monmouth Regional High School enrollment (not including the Grade 9 portion of the 37 students estimated for the Grades 7-9 range). This level of increase would be within enrollment levels of recent years. No hiring of faculty or impact to graduation rates would be expected.

Aside from the school capacity issues, there would potentially be significant fiscal impacts to all schools. Federal Impact Aid Section 8003(b) Basic Support Payments are designed to include payment for children who reside on federal property and the formula that provides weighting for these payments does include a category for civilian students living on federal property. However, as discussed in Section 3.3.1.3, the weight (and therefore the amount of aid received per student) assigned to students living on federal property whose parent is not on active duty in the uniformed services or working on federal property, is relatively small (.05, as compared to 1.0 for students of active duty military residing on federal property). While the calculation of payments is complex, depending upon a number of factors and rendering an accurate projection of future impact payments impossible, the decrease in the weight per student would result in a lesser payment to the LEA (U.S. Department of Education 2008c). The Federal Impact Aid program is administered by the U.S. Department of Education. The DoD Education Assistance Program (see Section 3.3.1.4) may also be available to assist affected schools.

Table 3-20 provides 2007-2008 per pupil costs for the Tinton Falls School District and Monmouth Regional High School District. The total cost per pupil was $16,108 for the Tinton Falls School District and $20,652 for the Monmouth Regional High School District. Applying the relative percentages of students by grade provided in the pie chart in Table 4-4 to the potential 145 school-age children results in an additional enrollment of about 23 students to the Monmouth Regional High School District (not including the Grade 9 portion of about 37 students estimated for the Grades 7-9 range) and an additional enrollment of about 122 students to the Tinton Falls School District (this number includes the Grade 9 portion of about 37 students estimated for the Grades 7-9 range that would attend Monmouth Regional). Using the per pupil costs mentioned above, the additional annual cost to the Tinton Falls School District and Monmouth Regional High School District due to additional enrollment from the proposed action could be $1,965,176 and $474,996, respectively. Carrying these annual totals through the 30-year out-lease period results in an estimated long-term cost to the Tinton Falls School District of almost $60 million and approximately $14 million to Monmouth Regional High School District. It should be noted that the cost of approximately $60 million over the 30-year out-lease period was also presented to the Navy during the DEIS public comment period by the Tinton Falls School District (see Volume 2 of this EIS for the complete comment).

Busing for NWS Earle students is currently conducted at the expense of the Tinton Falls and Monmouth Regional school districts. This expense for Monmouth Regional High School was approximately $36,000 for the 2006-2007 school year for the bus service that is contracted out, plus additional expenses for a Monmouth Regional High School bus that provides service to NWS Earle late in the day for those students that participate in after school/extracurricular activities (Webster 2008). Tinton Falls School District budgeted $120,000 for bus service for NWS Earle students for the 2007-2008 school year (Sydney-Gens 2008). Under the Proposed Action, demand for school bus service at NWS Earle would increase from current levels. However, the level of impact cannot be quantified given unpredictable changes in year-to-year demand from other existing communities, new development, and bus route changes. It should be noted that the per pupil costs used in the previous paragraph to estimate costs to school districts includes transportation costs (see Section 3.3.1.2).

Although this impact analysis has assumed that all 145 school-age children estimated from the Laurelwood housing area would attend public schools, private schools would also be potentially impacted by increased enrollment as a result of the proposed action; however, these schools place independent controls on enrollment to address capacity issues and tuition is collected to address fiscal impacts. Therefore, impacts to private schools would not be significant.

4.3.1.2 No Action Alternative

Under the No Action Alternative, changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, Tinton Falls School District and Monmouth Regional High School would not receive an influx of school-age children from the occupation of Laurelwood by civilians. Levels of school-age children associated with military families residing at NWS Earle are expected to remain steady as no significant changes in personnel levels assigned to NWS Earle are anticipated.

4.3.2 Law Enforcement

4.3.2.1 Proposed Action

During the out-lease period, the existing conditions for law enforcement with respect to jurisdictional responsibility described in Section 3.3.2 would be similar as there would be no change in the exclusive federal jurisdiction over the land at Laurelwood housing. The only difference would be that the Navy Criminal Investigative Service may not be the investigating authority, but some other federal agency. As vacant units at the Laurelwood housing area are occupied by civilians, the population served by NWS Earle and local law enforcement agencies in the surrounding community would increase. The principal burden would be on NWS Earle law enforcement, which has the primary responsibility for the Laurelwood housing area. Naval Weapons Station Earle law enforcement would alter manpower and equipment levels as necessary to continue to provide existing levels of service at the station. Any impacts to local law

enforcement manpower and equipment as a result of the proposed action area expected to be minor.

4.3.2.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Therefore, no impacts to law enforcement would occur.

4.3.3 Fire and Medical Services

4.3.3.1 Proposed Action

Whereas currently NWS Earle factors fire and EMS (and other municipal) services into the rental rates paid to the developer, under the proposed action, the services would be on a reimbursable basis (as is the case with other housing at NWS Earle that has been privatized). The developer of the Laurelwood housing area would have the option of approaching Colts Neck to be covered under their fire and emergency services, but Colts Neck would have to agree to provide the service. Therefore, during the out-lease period, NWS Earle fire and EMS would likely continue to serve the Laurelwood housing area. Naval Weapons Station Earle would alter manpower and equipment levels as necessary to continue to provide existing levels of service at the station. The additional service population for local area hospital and clinics associated with the proposed action and alternatives would be minor and expected to be within the range of service population growth projected by these service providers.

4.3.3.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle are expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Therefore, no impacts to fire and medical services would occur.

4.3.4 Recreation

4.3.4.1 Proposed Action

The recreation facilities within the Laurelwood housing area would continue to serve Laurelwood housing area residents, but the developer would have the option of altering (i.e., improving, providing more or less) recreation facilities at the housing area in accordance with the lease agreement. The increased use of recreation facilities in the local community due to the influx of civilians at the Laurelwood housing area is expected to be minor and widely dispersed among the multitude of recreation opportunities available in the area.

4.3.4.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Therefore, no impacts to recreation resources at NWS Earle or in the community would occur.

4.3.5 Summary of Impacts

Significant impacts from implementation of the proposed action, regardless of which alternative is selected, are anticipated at the Mahala F. Atchison Elementary School, the Swimming River Elementary School, and the Tinton Falls Middle School as a result of increased number of school-age children being sent to these schools under the proposed action. Specific impacts include physical capacity impacts, class size increases, additional school bus costs, and the potential need for additional faculty. Mitigation would include Federal Impact Aid funding from the U.S. Department of Education or redistricting of students. Redistricting could occur within a particular district, or agreements could be put in place between districts to distribute children into schools that have adequate capacity. No significant impacts to law enforcement, fire and medical services, or recreation resources in the region of influence are anticipated. Naval Weapons Station Earle would alter manpower and equipment levels as necessary to continue providing existing levels of service. The increased use of recreation facilities in the local community due to the influx of civilians at the Laurelwood housing area is expected to be minor and widely dispersed among the multitude of recreation opportunities available in the area.

No impacts to community facilities and services would occur under the No Action Alternative.

4.4 UTILITIES

Factors considered in assessing impacts to utilities address the ability of systems to maintain capacity at levels greater than existing expected peak demand; requirements to develop a new utility system or source; and utility demand that reaches, exceeds, or requires the use of a substantial portion of the existing system capacity. The focus of this analysis is on the change to the overall system demands and infrastructure capabilities. This analysis assumes a maximum estimated population of 853 (including adults and children) residing at the Laurelwood housing area with no increase to the base population over existing conditions.

4.4.1 Electricity

4.4.1.1 Proposed Action

The current average electrical consumption at NWS Earle is approximately 10,900,000 kWh per year (Mahoney 2007). As stated in Section 3.4.1, Jersey Power and Light indicated that there are currently no electricity supply issues at NWS Earle, nor has the Station historically exceeded

capacity, even during peak occupancy of housing areas (Garbarini 2007). Therefore, the additional electrical demand that would occur from full occupancy of the Laurelwood housing units would be expected to be accommodated by Jersey Central Power and Light service to NWS Earle. Increased demand for electricity above baseline levels would be the same for each of the action alternatives. According to the U.S. Department of Energy Statistics, the annual consumption of electricity in homes per person in New Jersey in 2001 was 2,997 kWh (U.S. Department of Energy Statistics 2007). Using this statistic and given that there are 300 housing units within Laurelwood and a maximum expected population of 853 residents, the increased demand would be approximately 2,556,441 kWh per year. Under the proposed action, with the increased demand for electricity by Laurelwood residents, total electricity consumption by the Station would be expected to be approximately 13,456,441 kWh. This represents approximately a 23 percent increase over current demand for electricity at NWS Earle.

As previously stated, NWS Earle has historically never exceeded the utility provider's capacity for electricity service, even during peak occupancy of housing areas and there are currently no issues with respect to capacity and demand at the Station. As shown in Table 1-2, the year 2000 represents a time period when the highest number of families were living at NWS Earle. Given that there are currently fewer homes overall at NWS Earle compared to previous years, the overall demand, even with full occupancy of the Laurelwood housing units, would not be expected to exceed capacity of the electrical supply. Since the Laurelwood housing units have been mostly unoccupied for several years, minor upgrades to existing electricity infrastructure may be required. Naval Weapons Station Earle would coordinate with Jersey Central Power and Light to determine if any upgrades would be required or if the Station would need to purchase additional capacity.

Part of the responsibility of the developer would be to ensure continued electricity service to the Laurelwood housing units once they are occupied by civilians during the out-lease period. Currently, NWS Earle is responsible for paying the electrical bills to Jersey Central Power and Light. Under the proposed action, the developer would identify a process for payment of the bills, such as including the cost in the rent of the housing units or requiring the occupants to pay their bills directly to the utility company.

Although there would be increased demand over existing conditions, significant impacts to the electricity supply are not expected as a result of implementing the proposed action.

4.4.1.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Naval Weapons Station Earle would continue to generate the same demand for electricity as described in Chapter 3. Therefore, no impacts to electrical utilities would occur.

4.4.2 Telecommunications

4.4.2.1 Proposed Action

Modern telecommunications infrastructure currently exists at the Laurelwood housing units, and would likely not require major upgrades. Minor expansions and updates to telephone, fiber optic, and similar information systems would be made to communication trunks as necessary by the local providers. Communication services in the local area would be expected to accommodate the population influx at Laurelwood since the infrastructure is already in place. Residents of the Laurelwood housing units would be responsible for setting up their telephone and cable television connections, and the developer would inform them of the billing process. Given that the telecommunications infrastructure is already in place, and local providers were able to provide service during the year 2000 when there was the highest number of families living at NWS Earle, implementation of the proposed action would not result in significant impacts to telecommunications, including telephone and television service at NWS Earle or the local community.

4.4.2.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Therefore, no impacts to telecommunications would occur.

4.4.3 Natural Gas

4.4.3.1 Proposed Action

Naval Weapons Station Earle consumed approximately 408,519 therms (approximately 40.9 billion Btu of natural gas) in 2006 (Mahoney 2007). As stated in Section 3.4.3, New Jersey Natural Gas indicated that there are currently no natural gas supply issues at NWS Earle , nor has the Station historically exceeded capacity, even during peak occupancy of housing areas (Lin 2007). Therefore, the additional natural gas demand that would occur from full occupancy of the Laurelwood housing units at NWS Earle would be expected to be accommodated by New Jersey Natural Gas. Increased demand for natural gas above baseline levels would be the same for each of the action alternatives. According to the U.S. Department of Energy Statistics, the per person consumption of natural gas in homes in New Jersey in 2001 was 26 million Btu (U.S. Department of Energy Statistics 2007). Using this statistic and given that there are 300 housing units within Laurelwood and a maximum expected population of 853 residents, the increased demand would be approximately 22 billion Btu per year. Under the proposed action, with the increased demand for natural gas by Laurelwood residents, total natural gas consumption by the Station would be expected to be approximately 63 billion Btu. This represents approximately a 54 percent increase over current demand at NWS Earle.

As previously stated, NWS Earle has historically never exceeded the utility provider's capacity for natural gas service, even during peak occupancy of housing areas and there are currently no issues with respect to capacity and demand at the Station. As shown in Table 1-2, the year 2000 represents a time period when the highest number of families were living at NWS Earle. Given that there are fewer homes overall at NWS Earle compared to previous years, the overall demand, even with full occupancy of the Laurelwood housing units, would not be expected to exceed capacity of the natural gas supply to the Station. Since the Laurelwood housing units have been mostly unoccupied for several years, minor upgrades to existing natural gas infrastructure may be required. Naval Weapons Station Earle would coordinate with New Jersey Natural Gas to determine if any upgrades would be required.

Part of the responsibility of the developer would be to ensure continued natural gas service to the Laurelwood housing units once they are occupied by civilians during the out-lease period. The developer would identify an appropriate method of billing to the utility company. Currently, NWS Earle is responsible for payment of natural gas bills to New Jersey Natural Gas.

Although demand for natural gas would increase over existing conditions, significant impacts to the natural gas supply are not expected as a result of implementing the proposed action.

4.4.3.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle are expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Naval Weapons Station Earle would continue to generate the same demand for natural gas as described in Chapter 3. Therefore, no impacts to natural gas utilities would occur.

4.4.4 Potable Water

4.4.4.1 Proposed Action

The additional potable water needs of the Laurelwood housing units at full occupancy would be satisfied by existing capacity. Assuming a 150 gallon per day (gpd) per person use for water (Departments of the Army, the Navy, and the Air Force 1987), the total estimated maximum population associated with the Laurelwood housing units (853) would increase potable water demand by 127,950 gpd. As discussed in Section 3.4.4, the average consumption of potable water for mainside NWS Earle in 2006 was approximately 0.132 mgd. Combining the estimated per day consumption for Laurelwood under full occupancy (127,950 gpd) with the 0.132 mgd average consumption for mainside NWS Earle results in a total estimated consumption of 0.259 mgd. The year 2000 demonstrated the greatest number of families living at NWS Earle (517 families; 269 families residing at Laurelwood) as shown in Table 1-2. During 2000, the Station consumed 114.7 million gallons of potable water in total, or approximately 0.31 mgd (Ely 2007b) demonstrating that there was sufficient capacity to maintain this demand in 2000. Under the proposed action, with the increased demand for potable water by Laurelwood residents, total

water consumption by the Station would be expected to be approximately 0.259 mgd, which is still below historical levels. Therefore, given that there are fewer homes overall at NWS Earle, the overall demand, even with full occupancy of the Laurelwood housing units, would not be expected to exceed capacity of the potable water supply.

Since the Laurelwood housing units have been mostly unoccupied for several years, minor upgrades to existing water pipes or other water supply infrastructure may be required. Required upgrades would be determined based on inspection of specific infrastructure. Part of the responsibility of the developer would be to ensure continued potable water service to the Laurelwood housing units once they are occupied by civilians during the out-lease period. Naval Weapons Station Earle would continue to be a purveyor and metering would occur. Currently, NWS Earle is responsible for paying the utility bills to New Jersey American Water Company. Under the proposed action, the developer would identify a process for paying the potable water bill.

Significant impacts to the potable water supply are not expected as a result of implementing the proposed action. In fact, implementing the proposed action would improve the quality of potable water at mainside NWS Earle. As described in Section 3.4.4, NWS Earle has experienced occasional elevated levels of trihalomethanes in the water supply. An aggressive flushing program combined with improved treatment methods by the water supply company has resulted in the Station meeting the regulatory requirements for trihalomethanes for the year 2007. Increased usage of potable water would improve the efficiency of the water distribution system at the Station by increasing throughput volume.

4.4.4.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Naval Weapons Station Earle would continue to generate the same demand for potable water as described in Chapter 3. Therefore, no impacts to potable water supply and distribution would occur.

However, if the No Action Alternative is implemented, the potable water distribution system at NWS Earle would function below optimal levels, as less regular use results in less throughput volume.

4.4.5 Wastewater

4.4.5.1 Proposed Action

Under the proposed action, wastewater from the Laurelwood housing units would continue to be treated by the wastewater treatment plant at NWS Earle.

The additional wastewater disposal needs of the Laurelwood residents would be satisfied by existing capacity of the wastewater treatment plant at NWS Earle. According to state of New Jersey planning regulations for wastewater treatment, the average projected wastewater flow for two-bedroom dwellings is 225 gpd, and the average projected flow for a three or more bedroom dwelling is 300 gpd (NJDEP 2007b). Table 4-5 shows the anticipated wastewater flow from full occupancy of the Laurelwood homes.

Table 4-5 Projected Wastewater Flow from Laurelwood Housing Units

Housing Type	Number of Units	Projected Wastewater Flow (gpd)	Projected Wastewater Flow (mgd)
Single-Family Attached (2 Bedroom Unit)	204	45,900 gpd	0.05 mgd
Single-Family Attached (3 Bedroom Unit)	60	18,000 gpd	0.02 mgd
Single-Family Attached (4 Bedroom Unit)	36	10,800 gpd	0.01 mgd
Totals	**300**	**74,700 gpd**	**0.08 mgd**

Currently, NWS Earle produces approximately 0.08 mgd of wastewater, so the anticipated population influx to Laurelwood would result in a 100 percent increase over current conditions. As stated in Section 3.4.5, the capacity of the wastewater treatment plant at the Station is 0.37 mgd. So even with the additional wastewater flow associated with Laurelwood, the total wastewater production would be 0.16 mgd, which is still well below the permitted capacity of the treatment plant.

Significant impacts from wastewater disposal are not expected as a result of implementing the proposed action. In fact, implementing the proposed action would improve wastewater disposal services. Increased wastewater flow would improve the efficiency of the wastewater treatment plant at the Station by increasing throughput volume which improves the functioning of the system processes.

4.4.5.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle are expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Naval Weapons Station Earle would continue to generate the same quantity of wastewater as described in Chapter 3. Therefore, no impacts to the wastewater treatment system would occur.

However, if the No Action Alternative is implemented, the wastewater treatment plant system at NWS Earle would function below optimal levels, as less regular use results in less throughput volume.

4.4.6 Solid Waste Disposal

4.4.6.1 Proposed Action

Under the proposed action, solid waste at the Laurelwood housing area would continue to be picked up at curbside by a private contractor and transported to the Monmouth County Reclamation Center located in Tinton Falls. During the out-lease period, the developer would be responsible for ensuring continued solid waste disposal service to Laurelwood residents.

According to the USEPA, the national average for waste generation per person is approximately 4.5 pounds of waste per person per day (USEPA 2007a). Based on this average, the increase in solid waste generated for the estimated 853 maximum number of residents of the Laurelwood housing units would be 3,839 pounds per day, or 701 tons per year. The solid waste production of NWS Earle in fiscal year 2007 was approximately 191 tons of trash and approximately 45 tons of recycled material (Dziedzicki 2007). Solid waste production would increase over existing conditions with full occupancy of the Laurelwood homes, but the additional waste generated would not be expected to significantly impact disposal capacity in the region. The additional anticipated solid waste generated by the proposed action is only 0.1 percent of the annual average solid waste received by the Monmouth County Reclamation Center (see Section 3.4.6). Furthermore, the Monmouth County Reclamation Center has sufficient capacity to serve the needs of the county through 2015, with room for expansion after that.

Regarding the proposed access road and fence to the Laurelwood housing area, construction waste would be properly disposed of and recycled when possible. No hazardous materials would be used during the road and fence construction process.

Therefore, although there would be an increase in solid waste disposal over existing conditions, the proposed action would not be expected to significantly impact solid waste disposal services or result in significant impacts from solid waste in the region.

4.4.6.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Naval Weapons Station Earle would continue to generate the same quantity of wastewater as described in Chapter 3. Therefore, no impacts to solid waste collection facilities in the region would occur.

4.4.7 Stormwater Management

4.4.7.1 Proposed Action

Under the proposed action, construction of the Laurelwood housing area access road and fence would result in a temporary increase in runoff and total suspended particulate matter to nearby surface water. To minimize potential impacts, best management practices such as silt fencing would be implemented during the construction period. New Jersey is a delegated National Pollutant Discharge Elimination System (NPDES) state with general permitting authority. Therefore, NWS Earle would notify the NJDEP of any proposed construction activity that would disturb greater than 1 acre at the Station and would apply for coverage under the applicable permits for erosion and sedimentation control from construction activities. After detailed site plans of the proposed construction have been finalized, a determination of the exact area to be disturbed and the net impervious cover created would occur and the appropriate permits would be obtained from the State of New Jersey.

Construction activities would have localized (i.e., site-specific) effects on surface water hydrology; however, best management practices would be incorporated during construction to minimize potential erosion, runoff, and sedimentation. The proposed action would result in a net increase in impervious surfaces due to construction of the access road to the Laurelwood housing area. Table 4-6 shows the approximate amount of net impervious surface area that would be created for each of the proposed action alternatives. As described in Chapter 2, each of the proposed alignments utilizes existing roadways at NWS Earle but some additional road improvements are required for each alignment in order to upgrade the existing roads to New Jersey standards for a residential roadway. As previously stated, the estimates shown in Table 4-6 are approximations based on preliminary designs; a determination of the exact area to be disturbed and net impervious cover would occur once final site plans are completed.

The net increase in impervious surfaces would result in an associated increase in stormwater discharge volumes and intensities. Any increases in stormwater volume would be minor and are expected to be accommodated by the existing stormwater discharge infrastructure at NWS Earle. Following completion of final road designs, if additional stormwater management controls are necessary to mitigate any potential impacts downstream of the project (e.g., increased erosion and sedimentation, steam bank scouring), these controls would be designed and sited in accordance with all permit requirements and would avoid and minimize impacts to wetlands and other sensitive areas to the extent practicable. Increases in impervious surfaces as a result of proposed construction are not anticipated to affect groundwater resources. Construction operations would not reach depths that could affect groundwater resources. Therefore, no significant impacts would occur from stormwater discharge as a result of implementing the proposed action.

Table 4-6 Net Increase in Impervious Surface Area for each Alternative

Alternative	Net Increase in Impervious Surface Area
Alternative Alignment 1	74,052 SF (1.7 acres)
Alternative Alignment 2	82,764 SF (1.9 acres)
Alternative Alignment 3	43,560 SF (1.0 acres)
Alternative Alignment 4	78,408 SF (1.8 acres)

Note: Assumes new road would have two 13 foot wide lanes.

4.4.7.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, impacts from stormwater would not occur.

4.4.8 Energy Requirements and Conservation Potential of Various Alternatives

The CEQ regulations implementing NEPA [specifically 40 CFR 1502.16(e)] requires an analysis of energy requirements and conservation potential of various alternatives. Energy requirements and capacity issues have been discussed in previous sections. Opportunities for energy conservation for each alternative is limited, since the proposed action involves provision of unimpeded access between the Laurelwood housing area and Route 34. As discussed in Section 4.2.1, the developer has indicated that each of the 300 Laurelwood units would be refurbished prior to rental. Interior refurbishments would include a new refrigerator, gas stove, dishwasher, and garbage disposal. Selection of energy efficient appliances would result in appreciable energy conservation over the 30 year out-lease period.

4.4.9 Summary of Impacts

Utility demand would increase over existing levels at NWS Earle under the proposed action, regardless of which alternative is selected; however, no significant impacts to the provision of utilities are anticipated. Since the Laurelwood housing units have been mostly unoccupied for several years, minor upgrades to infrastructure may be required. Required upgrades would be determined based on inspection of specific infrastructure. The proposed action would result in a net increase in impervious surfaces due to construction of the access road to the Laurelwood housing area. These increases vary between the four alternatives. The net increase in impervious surfaces would result in an associated increase in stormwater discharge volumes and intensities. These impacts are expected to be offset by existing adequate stormwater discharge infrastructure at the installation. If additional stormwater management controls are necessary to mitigate any potential impacts downstream of the project, these controls would be designed and sited in accordance with all permit requirements and would avoid and minimize impacts to wetlands and other sensitive areas to the extent practicable. Implementation of the proposed action would improve wastewater treatment infrastructure and potable water infrastructure at the installation as increased flow would improve the efficiency of the treatment plant by increasing throughput volume, which improves the functioning of the system processes. Similarly, increased

throughput volume of potable water would reduce the potential for elevated trihalomethane levels in the water.

No impacts to utilities would occur under the No Action Alternative. However, if the No Action Alternative is implemented the potable water distribution system and wastewater treatment system at NWS Earle would continue to function at less than optimal levels.

4.5 TRAFFIC

Typically in traffic impact study evaluations, the consequences of traffic relating to the implementation of any alternative are weighed against the existing conditions to ascertain any increased effects over the existing condition. In this particular study, since the proposed development project is anticipated to be completed by 2010, the end state year of 2010 becomes the baseline condition year for comparison purposes. Even under the No Action Alternative, there would likely be local area growth and consequently traffic increases. In order to have 'like' comparisons, 2010 becomes the baseline year for analysis. The criteria for determining the threshold levels for significant impact are as follows:

No Significant Impact – Changes to the traffic patterns and levels of service that maintain the same or nearly the same levels of service as is expected under the No Action Alternative without crossing the threshold to failure. An intersection is said to have failed when it reaches a Level of Service (LOS) E or worse. However, if any given intersection had already failed under the No Action Alternative and continues to fail under an action alternative, then it could be said that the alternative is not causing a negative effect beyond what was already there. For example, an intersection that is at LOS E for the No Action Alternative and remains at LOS E for another alternative is therefore considered to have no significant impact.

Moderate Impact – Changes to the traffic patterns and LOS that would cause a roadway segment or an intersection to perform more poorly as a result of implementing that action compared with what is expected under the No Action Alternative, but without the failure of the roadway segment or the intersection. A drop from LOS A to LOS C, or from LOS B to LOS D, comparing specific roadway segments or intersections between the action alternatives and the No Action Alternative, would be designated as moderate impacts.

Severe Impact – Changes to the traffic patterns and LOS that would cause a roadway segment or an intersection to fail as a result of implementing that action beyond what is expected under the No Action Alternative. For the purposes of this EIS, a severe impact would be considered when a roadway segment or an intersection that had not failed under the No Action Alternative fails under any of the action alternatives.

Impacts can be expected where there is a substantial increase in the number of personnel directly attributable to the alternative, or where traffic patterns are significantly altered by proposed development so as to create a potential loss in LOS, either on a roadway segment or at an intersection.

Additionally, the NJDOT Access Code (NJDOT 1997) provides regulatory guidance on the amount of allowable decrease in LOS permissible when comparing an action alternative to the No Action Alternative. Pursuant to section 16:47-4.24, subheading 2 (for a rural lot) of the New Jersey Administrative Code:

> *For movements operating at level A, B, C or D, some deterioration will be allowed but not below level D;*
>
> *For movements operating at level E or F, no deterioration will be allowed.*

Therefore, if any movements are projected to operate at level 'E' or 'F' under the No Action Alternative, the impacts of any additional action alternative traffic would have to be offset by mitigation improvements such that the level 'E' and 'F' movements do not experience any increase in average delay.

It is anticipated that full occupancy of Laurelwood under any of the action alternatives would occur in the year 2010. Evaluation of traffic conditions at the completion of the proposed action, therefore, will focus on projected traffic conditions in that baseline year.

Whether or not the proposed action occurs, it is anticipated that traffic volumes in the area will increase between 2007 and 2010 due to other area developments as well as general increases in population and employment in adjoining municipalities.

4.5.1 Background Growth

Background growth is applied as an annual increase in existing (2007) traffic volumes. The NJDOT publishes a background growth rate table, which presents annual growth rate values based on the location (county), as well as the functional classification of the roadway involved.

Based on data presented in the NJDOT growth rate table for the types of roadways present in the study area, an annual growth factor of 2.5 percent was applied for all roadways in the study area. for a 3-year period, from 2007 to 2010. The overall growth in traffic volumes is therefore projected to be 7.7 percent. This increase over the existing 2007 traffic volumes is reflected in all future traffic volumes in the traffic study, with the exception of all movements directly into or out of Esperance Road. Since movements in and out of Esperance Road are U.S. Navy base-related volumes they are not susceptible to typical population or employment growth. These specific volumes in and out of the base at Esperance Road have not been increased over existing conditions as part of the No Action Alternative.

4.5.1.1 Other Area Developments

At the time of the traffic study, no other specific developments in the area were identified by Monmouth County personnel. The annual background growth rate is somewhat conservative, especially when applied over a number of years. Therefore, even if another development is

proposed in the immediate area, it is believed that the traffic volume projections in the traffic study would still accurately represent future no action conditions.

4.5.1.2 Roadway Improvements

Existing proposed improvements to roadways in the immediate area could support any changes in circulation or travel patterns from the proposed action. Colts Neck Township has proposed improvements in the Circulation Plan Element of the Colts Neck Township Master Plan (Colts Neck Township 2004). Included are priority improvements at the Colts Neck Road/Route 34 intersection. Phase I will upgrade Route 34 from south of Colts Neck Road north to Merchants Way, and will upgrade Colts Neck Road from New Street to the Meridian Academy to improve operating characteristics and safety. Separate turning lanes and traffic signal phases for left turn movements will be provided at the intersection. Plans also include a new left-turn lane along Colts Neck Road at Heyers Mill Road. In a conversation with Bob Marshall of the NJDOT's Bureau of Project Development on December 12, 2008, Mr. Marshall indicated that construction of improvements at this location would begin no earlier than 2011, with right-of-way acquisition potentially delaying the improvements further (Marshall 2008).

South of Colts Neck Road, new roadways east and west of, and parallel to Route 34 are included along with a new signalized intersection on Route 34 between Routes 18 and Colts Neck Road. The eastern roadway will begin across Route 34 at a new signalized intersection. The road will curve northward and provide access to the rear of existing lots. This will be a municipal road constructed by private development in conjunction with the development or redevelopment of the properties along the road.

The western road heads west from Leland Road and curves northward and returns to Route 34. An additional access easement to Delicious Orchards is proposed from the loop road. Connecting Delicious Orchards to the new road with a signalized intersection will provide for exiting traffic and will eliminate a potential traffic hazard for left turns out of Delicious Orchards and the need for traffic directional officers during seasonal peak periods. The western road has already been constructed.

4.5.2 Future Year 2010 Traffic Conditions Without Development (No Action Alternative)

The No Action Alternative traffic volumes were calculated for the morning and evening peak periods, respectively. Again, these are the volumes anticipated to be present in the year 2010 even if the proposed action does not take place. These volumes take into account the Green Acres housing area access road proposed to the south of the main gate entrance (see Section 1.3.4.1) and the removal of those trips from the main gate.

The projected Year 2010 baseline levels of service for the weekday morning and evening peak periods show that the increases in traffic volumes are anticipated to have some impacts on the study area intersections, as discussed below (see Table 4-7).

Table 4-7 Baseline 2010 Intersection Level of Service

Weekday Morning Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Esperance Rd	A	F		C	A		D			E			E
Rt. 34 & Colts Neck Rd	C	F	C	C	D	D	F			F			F
Rt. 34 & Rt. 33							d						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			
Rt. 34 & Rt. 18	A (weave)												

Weekday Evening Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Esperance Rd	A	C		B	B					D			B
Rt. 34 & Colts Neck Rd	D	D	C	C	E	D	F			F			F
Rt. 34 & Rt. 33							c						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			
Rt. 34 & Rt. 18				B (merge)									

Capital letters are used for intersections controlled by traffic signals. Lower case letters are used for unsignalized intersections. Gray cells indicates absence of a LOS classification for that specific segment of an intersection; either the traffic is considered 'freeflowing' and is not impeded by cross traffic; the direction may not pertain to that specific intersection; or there is zero volume for that period. Overall ratings are not provided for unsignalized intersections because they are skewed by heavy volumes of through traffic that experience no delay. Source: U.S. Navy 2008b

4.5.2.1 Route 34 and Esperance Road

During the morning peak period, the northbound Route 34 movement is anticipated to operate at level ‘F’ (a decrease from ‘E’). During this period the overall intersection would operate at level ‘E’. All other movements during this period would operate at the same levels of service as under existing conditions. All Route 34 movements would operate at level ‘C’ or better during the evening peak period, and the Esperance Road approach would continue to operate at level ‘D’ (U.S. Navy 2008b).

4.5.2.2 Route 34 and Colts Neck Road

The NJDOT is currently developing an improvement plan for the intersection of Route 34 and Colts Neck Road—one of the most congested in the area of the proposed project. However, it is not anticipated that this improvement will be complete prior to the year 2010. Assuming the existing intersection geometry and signal operation, all movements will continue to operate at the same levels of service as under existing conditions, with two exceptions during the weekday evening peak hour: the northbound Route 34 left turn will drop from level C to D; and the southbound Route 34 through movement will drop from level D to E. Again, these impacts are anticipated without the proposed Laurelwood development (U.S. Navy 2008b).

4.5.2.3 Route 34 and Route 33

The left-turn movement onto Route 34 northbound would operate at level ‘d’ during the weekday morning peak period (a decrease from level 'c'), and level ‘c’ (no change from the existing baseline year) during the weekday evening peak period.

4.5.2.4 Colts Neck Road and Hockhockson Road

The westbound Colts Neck Road approach would continue to operate at level ‘a’ as under existing conditions. The northbound Hockhockson Road approach would operate at level ‘d’ during both peak periods (a decrease from level 'c' for the morning peak period).

4.5.2.5 Route 34 and Route 18

The northbound weave in the weekday morning peak hour and the southbound merge in the weekday evening peak hour would continue to operate at levels ‘A’ and ‘B’, respectively, as under existing conditions. Vehicle speed would be 34.64 mph (down from 35.4 mph under existing conditions) for the northbound weave and 50.9 mph (down from 51.0 mph under existing conditions) for the southbound merge (U.S. Navy 2008b).

4.5.3 Trip Generation of the Proposed Action

Volume of traffic from the proposed action was calculated using the NJDOT’s Highway Access Permit System (NJDOT 2008). Trip generation estimates from this publication were obtained for land use code #230, Residential Condominium/Townhomes and #210, Housing, Single Family, which most closely represents the type of housing involved with the proposed action (Table 4-8).

In order to compare the traffic movement of the proposed action to the no action alternative traffic conditions, a distribution study of the proposed traffic movements or patterns was conducted. This direction distribution study was based on historic information from NJDOT and from direct observations on the two-way traffic patterns in the study area. A volume-weighted distribution for proposed traffic patterns has been provided.

Table 4-8 Trip Generation of the Proposed Action

	Entering	Exiting	Total
Alignment 1			
Weekday Morning Peak Hour	28	127	155
Weekday Evening Peak Hour	127	72	199
Weekday Daily Trips	1,003	1,003	2,006
Alignments 2 and 3			
Weekday Morning Peak Hour	32	140	172
Weekday Evening Peak Hour	133	76	209
Weekday Daily Trips	1,048	1,048	2,096
Alignment 4			
Weekday Morning Peak Hour	23	104	127
Weekday Evening Peak Hour	100	56	156
Weekday Daily Trips	817	817	1,634

Source: U.S. Navy 2008b

For evaluating potential traffic impacts on the external roadways, there are three unique alternatives.

Alternative Alignment 1—access to Route 34 near Route 18. Based on discussions with the NJDOT, this location is too close to the Route 18 interchange to consider signalization; this location would be limited to right turn-in, right turn-out access/egress only, with the Route 18 cloverleaf interchange and a modified Esperance Road traffic signal accommodating U-turns (see Figure 2-2).

Alternative Alignments 2 and 3—access to Route 34 roughly midway between Route 18 and Esperance Road. A traffic signal would be installed at this location.

Alternative Alignment 4—access to Route 34 roughly 1,700 feet south of Esperance Road. A full movement unsignalized intersection would be implemented at this location.

Note that all of the proposed access alignments include "new" traffic associated with full occupancy of the 300 housing units at Laurelwood. In terms of traffic volumes, the alignments include varying levels of diverted traffic that is currently using Esperance Road. As such, the intersections of Colts Neck Road with Route 34 and with Hockhockson Road, and of Routes 33 and 34, are anticipated to carry the same volumes (with the same levels of service) across all four alternative alignments.

The fifth alternative would be the No Action Alternative.

4.5.4 Proposed Action

Potential impacts to traffic vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

4.5.4.1 Alternative Alignment 1

Alternative Alignment 1 includes a new access roadway extending east from Route 34 at a point south of the Route 18 interchange, approximately 2,100 feet north of Esperance Road. The Alternative Alignment 1 access roadway would provide access to the 300-unit Laurelwood housing area. Based on the anticipated configuration of this alignment, it would also serve the existing Stark Road housing area. The anticipated future traffic volumes for this scenario include some reduction of Esperance Road volumes, since that roadway would no longer serve the Stark Road housing area.

Minor impacts to Stark Road residents would result from additional vehicle trips associated with the Laurelwood housing area. Vehicle speeds would be limited to 25 miles per hour and focused within the morning and peak hours.

At Route 34 and Esperance Road, under Alternative Alignment 1, there is anticipated to be some reduction in the Esperance Road traffic volumes due to the diversion of some traffic associated

with the existing Stark Road housing area, which would be accessed via the proposed new access roadway under Alternative Alignment 1. This reduction in volume is reflected in the LOS in Table 4-9. This diversion has been assumed based on data provided by the base regarding the composition of residents of the on-base housing. In terms of intersection capacity, no mitigation at this intersection would be required—comparison of the no-build and build levels of service for this alignment do not indicate any impact deemed severe or beyond that permitted by the New Jersey Access Code (U.S. Navy 2008b).

Table 4-9 Level of Service for Alternative Alignment 1

Weekday Morning Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Alignment 1 Access												f	
Rt. 34 & Esperance Rd	A	D			A		D			D			C
Rt. 34 & Colts Neck Rd	C	F	C	C	D	D	F			F			F
Rt. 34 & Rt. 33							d						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			
Rt. 34 & Rt. 18	A (weave)												

Weekday Evening Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Alignment 1 Access												c	
Rt. 34 & Esperance Rd	A	B			C					D			C
Rt. 34 & Colts Neck Rd	D	D	C	C	E	D	F			F			F
Rt. 34 & Rt. 33							c						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			
Rt. 34 & Rt. 18				B (merge)									

Capital letters are used for intersections controlled by traffic signals. Lower case letters are used for unsignalized intersections. Gray cells indicates absence of a LOS classification for that specific segment of an intersection; either the traffic is considered 'freeflowing' and is not impeded by cross traffic; the direction may not pertain to that specific intersection; or there is zero volume for that period. Overall ratings are not provided for unsignalized intersections because they are skewed by heavy volumes of through traffic that experience no delay. Source: U.S. Navy 2008b

The new access point on Route 34 would be a right-turn in/right-turn out intersection. Therefore, this alignment relies on the ability for southbound Route 34 drivers to make a U-turn, through a near-side "jughandle" at Esperance Road (see Figure 2-2). This requirement would involve a significant reconstruction of the Esperance Road intersection. In addition, since the existing intersection would be disturbed, the NJDOT may request additional upgrades to current standards, including a northbound deceleration/right-turn lane into the base at Esperance Road.

Also since the proposed intersection would not be a candidate for signalization (too close to adjacent Route 18 interchange according to NJDOT criteria), this access is proposed to be

configured as a "right-turn in, right-turn out" only access/egress. Acceleration and deceleration lanes on northbound Route 34 likely would be required by NJDOT. In addition, at an August 2007 meeting, NJDOT staff indicated that a median barrier probably would be required to enhance safety, extending along a portion of Route 34 between Esperance Road and the widened median at Route 18. This barrier would prohibit left- or U-turns by drivers seeking to reduce their travel time.

At Route 34 and Colts Neck Road, analysis for Alignment 1 has been performed assuming the NJDOT intersection improvements would not be constructed by 2010, as shown in Table 4-9. It is noted that a Year 2011 analysis shows that if the proposed NJDOT intersection improvements are implemented, all movements at this intersection would operate at level 'D' or better during both peak hours. It is also noted that, in the year 2010, the anticipated site traffic from Alignment 1 would comprise only 1.3 percent of total weekday morning peak hour traffic volumes, and 1.5 percent of total weekday evening peak hour volumes at this intersection (U.S. Navy 2008b).

At Route 34 and Route 33, the left/U-turn movement would continue to operate at level 'c' or 'd' during the two peak periods. It is expected that the impact of the proposed action would not require improvement to this location, and therefore no changes at this intersection have been assumed (nor for any of the other proposed alignments) (U.S. Navy 2008b).

At Colts Neck Road and Hockhockson Road, all levels of service would remain the same as under the No Action Alternative. No improvements would be required at this intersection under Alternative Alignment 1 (U.S. Navy 2008b).

At Route 34 and Route 18, all levels of service would remain the same as under the No Action Alternative. Vehicle speed would be 32.96 mph (down from 34.64 mph under existing conditions) for the northbound weave and 50.9 mph (no change from existing conditions) for the southbound merge (U.S. Navy 2008b).

4.5.4.2 Alternative Alignments 2 and 3

Under these two alternative alignments, traffic associated with the Laurelwood housing area would access the roadway network via a proposed access roadway extending east from Route 34 in the area of the existing Green Drive housing. The Green Drive housing area, as well as the Stark Road housing area, would also have access via the new roadway, as opposed to Esperance Road as under existing conditions. Future traffic volumes for Alignments 2 and 3 reflect diversion of Stark Road and Green Drive traffic to the new access roadway based on percentage data provided by NWS Earle staff.

Minor impacts to Stark Road and Green Drive residents would result from additional vehicle trips associated with the Laurelwood housing area. Vehicle speeds would be limited to 25 miles per hour and focused within the morning and peak hours.

Based on review of projected traffic volumes on the new access road and on Route 34, the conditions of the Four-Hour Warrant for signalization would be satisfied (U.S. Navy 2008b).

This warrant requires minimum volume criteria to be satisfied for 4 hours of a typical day, with a minimum side street approach volume of 60 vehicles per hour. In projections for the 4 highest hours, the lowest side street approach volume is 52 vehicles, which is technically below the 60-vehicle limit. It is expected, however, that NJDOT would consider this volume close enough to satisfy the criteria. As such, the installation of a traffic signal at this access location is anticipated. It is anticipated that a signal at this location can provide good levels of service; i.e. level 'C' or better for all Route 34 movements, and level 'D' for the access roadway approach to Route 34 (U.S. Navy 2008b). Table 4-10 provides LOS for both a signalized and unsignalized intersection with Route 34.

Table 4-10 Level of Service for Alternative Alignments 2 & 3

Weekday Morning Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Alignment 2/3 Access (if signalized)		C	A	C	A					D (L-R only)			C
Rt. 34 & Alignment 2/3 Access (if unsignalized)				b						f (L-R only)			
Rt. 34 & Esperance Rd	A	D		C	A		D			D			C
Rt. 34 & Colts Neck Rd	C	F	C	C	D	D	F			F			F
Rt. 34 & Rt. 33							d						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			

Weekday Evening Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Alignment 2/3 Access (if signalized)		B	A	A	A					D (L-R only)			B
Rt. 34 & Alignment 2/3 Access (if unsignalized)				b						f (L-R only)			
Rt. 34 & Esperance Rd	A	C		B	B					D			B
Rt. 34 & Colts Neck Rd	D	D	C	C	E	D	F			F			F
Rt. 34 & Rt. 33							c						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			

Capital letters are used for intersections controlled by traffic signals. Lower case letters are used for unsignalized intersections. Gray cells indicates absence of a LOS classification for that specific segment of an intersection; either the traffic is considered 'freeflowing' and is not impeded by cross traffic; the direction may not pertain to that specific intersection; or there is zero volume for that period. Overall ratings are not provided for unsignalized intersections because they are skewed by heavy volumes of through traffic that experience no delay. Source: U.S. Navy 2008b

At Route 34 and Esperance Road, without any adjustments to the existing signal, a moderate impact is forecast in the form of a slight degradation in the existing LOS 'F' for the northbound Route 34 approach. However, analysis indicates that an adjustment to the signal timing during the weekday morning peak period can mitigate the anticipated moderate impact on the northbound approach to LOS 'D' and this mitigation is assumed in Table 4-10 (U.S. Navy 2008b).

At Route 34 and Colts Neck Road, analysis for Alignments 2 and 3 has been performed assuming the NJDOT intersection improvements would not be constructed by 2010, as shown in Table 4-10. It is noted that a Year 2011 analysis shows that if the proposed NJDOT intersection improvements are implemented, all movements at this intersection would operate at level 'D' or better during both peak hours. It is also noted that, in the year 2010, the anticipated site traffic from Alignments 2 or 3 would comprise only 1.5 percent of total weekday morning peak hour traffic volumes, and 1.6 percent of total weekday evening peak hour volumes at this intersection (U.S. Navy 2008b).

At Colts Neck Road and Hockhockson Road, all levels of service would remain the same as under the No Action Alternative conditions. At Routes 33 and 34, the left/U-turn movement would continue to operate at level 'c' or 'd' during the two peak periods (U.S. Navy 2008b).

A LOS analysis was not conducted at the Route 34 and Route 18 intersection because it is not required as part of a traffic impact study pursuant to the New Jersey Access Code [Title 16, Chapter 47, Section 4.36 (NJDOT 1997)] given the estimated volumes for Alternative Alignments 2 and 3.

4.5.4.3 Alternative Alignment 4

Under Alternative Alignment 4, traffic would access Laurelwood via a proposed roadway extending east from Route 34 to the south of Esperance Road. This roadway would serve only Laurelwood housing area traffic—all other existing on-base housing areas would continue to be served by the main gate at Esperance Road. The sight distance from the crest of the hill on Route 34 south of the main gate to this proposed entrance was found to meet the prevailing NJDOT design criteria of 1,000 feet based on a 55-mile-per-hour speed (Route 34 at this location is marked 50 miles per hour).

A traffic signal warrant analysis was conducted for the intersection of Route 34 and the Alternative Alignment 4 access point. The analysis concludes that a traffic signal would not be warranted at this location (U.S. Navy 2008b). The conditions of the Peak Hour Warrant would be satisfied; however, it is unlikely an authorization to design a traffic signal on a State highway would be granted based on the Peak Hour Warrant alone. Therefore, an unsignalized access is proposed. (Under Alternative Alignment 1, a "right-turn in, right-turn out" only access/egress was suggested by NJDOT; it is believed this was suggested, in part, by the nearby U-turn options available at the Route 18 interchange and a reconfigured Esperance Road intersection.) A "right-turn in, right-turn out" configuration is preferred by the NJDOT for unsignalized intersections along a roadway like Route 34. However, from the Alternative Alignment 4 roadway, the nearest U-turn opportunity to the south is at the junction of Routes 33 and 34, approximately 2.5 miles south. This should not be considered an efficient U-turn option; therefore Alternative Alignment 4 traffic volume projections included a full-movement unsignalized access roadway.

A dedicated southbound Route 34 left-turn lane, and acceleration and deceleration lanes on northbound Route 34 at this location, are proposed based on current NJDOT design criteria. For

Alternative Alignment 4, in this unsignalized (i.e. stop-controlled) condition, the overall access approach to Route 34 is projected to operate at level 'f' during the weekday morning peak period, and level 'e' during the weekday evening peak period (see Table 4-11). However, the LOS for the left turn (onto southbound Route 34) from the access road would be 'f' for both peak periods analyzed (U.S. Navy 2008b).

At the intersection of Route 34 and Esperance Road, there is a much greater anticipated impact than under the other three alignments. This is due to the fact that the proposed Laurelwood housing area access is located to the south of Esperance Road, while the directional distribution indicates that two-thirds of site traffic would be oriented to the north. Therefore the proposed development adds much more traffic to the Esperance Road intersection under Alternative Alignment 4. In order to mitigate these anticipated negative impacts, the analysis indicates that a dedicated northbound right-turn lane, and separate left- and right-turning lanes would be required at the Esperance Road intersection. These improvements are reflected in the LOS projections (U.S. Navy 2008b).

Table 4-11 Level of Service for Alternative Alignment 4

Weekday Morning Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Alignment 4 Access				b						f (L-R only)			
Rt. 34 & Esperance Rd	A	D	A	C	A		D	D		D	E		C
Rt. 34 & Colts Neck Rd	C	F	C	C	D	D	F			F			F
Rt. 34 & Rt. 33							d						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			

Weekday Evening Peak Hour													
Intersection	**North Bound**			**South Bound**			**East Bound**			**West Bound**			**Overall**
	L	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	
Rt. 34 & Alignment 4 Access				a						e (L-R only)			
Rt. 34 & Esperance Rd	A	C	A	B	B		D	D		D	D		C
Rt. 34 & Colts Neck Rd	D	D	C	C	E	D	F			F			F
Rt. 34 & Rt. 33							c						
Colts Neck Road & Hockhockson Rd	d (L-R only)									a			

Capital letters are used for intersections controlled by traffic signals. Lower case letters are used for unsignalized intersections. Gray cells indicates absence of a LOS classification for that specific segment of an intersection; either the traffic is considered 'freeflowing' and is not impeded by cross traffic; the direction may not pertain to that specific intersection; or there is zero volume for that period. Overall ratings are not provided for unsignalized intersections because they are skewed by heavy volumes of through traffic that experience no delay. Source: U.S. Navy 2008b

At Route 34 and Colts Neck Road, analysis for Alignment 4 has been performed assuming the NJDOT intersection improvements would not be constructed by 2010, as shown in Table 4-11. It is noted that a Year 2011 analysis shows that if the proposed NJDOT intersection improvements are implemented, all movements at this intersection would operate at level 'D' or better during

both peak hours. It is also noted that, in the year 2010, the anticipated site traffic from Alignment 4 would comprise only 1.1 percent of total weekday morning peak hour traffic volumes, and 1.2 percent of total weekday evening peak hour volumes at this intersection (U.S. Navy 2008b).

At Colts Neck Road and Hockhockson Road, all levels of service would remain the same as under the No Action Alternative conditions. At Routes 33 and 34, the left/U-turn movement would continue to operate at level 'c' or 'd' during the two peak periods (U.S. Navy 2008b).

A LOS analysis was not conducted at the Route 34 and Route 18 intersection because it is not required as part of a traffic impact study pursuant to the New Jersey Access Code [Title 16, Chapter 47, Section 4.36 (NJDOT 1997)] given the estimated volumes for Alternative Alignment 4.

4.5.5 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated.

As discussed in Section 4.5.2, even under the No Action Alternative, there would still be changes in the traffic service in the ROI due to background growth from development in the area. Analysis of these results indicates that there would be a significant negative impact due to background traffic increases under the No Action Alternative for the north bound morning peak period movement at the Route 34 and Esperance Road intersection. This possibly could be mitigated by adjustment of the existing traffic signal timing (similar to that recommended in the analysis of Alternative Alignments 2 and 3).

4.5.6 Summary of Impacts

The proposed action would result in localized, short-term on-station impacts to traffic from construction activities. During the period of effect, action would be taken to offset this impact by notifying the NWS Earle population about detours and delays as appropriate. Minor impacts to Stark Road residents (under Alternatives 1, 2, and 3) and Green Drive residents (under Alternatives 2 and 3) would result from additional vehicle trips associated with the Laurelwood housing area. Vehicle speeds would be limited to 25 miles per hour and focused within the morning and peak hours.

The proposed action would have a minor impact on the Route 34 and Colts Neck Road intersection, which experiences significant delays. However, the traffic associated with the proposed action would only represent between one and two percent of the overall volume at that intersection. Construction is required to the west side of the Route 34 and Main Gate intersection to accommodate the proposed new jughandle for Alternative Alignment 1. Under Alternative Alignments 2 and 3, a moderate impact is expected in the form of a slight degradation in the

existing level of service for the northbound Route 34 approach to the alignment entrance. This impact could be offset through an adjustment to the signal timing at the Route 34/Esperance Road traffic signal. Under Alternative Alignment 4, a minor impact is expected in the form of delays at the intersection of Route 34 and Esperance Road. This impact could be offset by a dedicated northbound right-turn lane, and separate left- and right-turning lanes.

No impacts to traffic would occur under the No Action Alternative.

4.6 AIR QUALITY

Air emissions resulting from the action alternatives were evaluated in accordance with federal, state, and local air pollution standards and regulations. Air quality impacts from a proposed activity or action would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- impair visibility within any federally-mandated federal Class I area.

The temporary increase in emission levels due to road construction under the proposed action was calculated as part of the air quality analysis. According to USEPA General Conformity Rule (40 CFR Part 51, Subpart W), any proposed federal action that has the potential to cause violations in a NAAQS maintenance area must undergo a conformity analysis. As per 40 CFR 93, Subpart B, compliance with the General Conformity Rule is presumed if the emissions associated with a federal action are below the relevant *de minimis* thresholds during a given year. Monmouth County is designated as both an O_3 Subpart 2 Moderate Nonattainment area and a nonattainment area for the annual $PM_{2.5}$ standard. Additionally, it has been recommended to be nonattainment for the 24-hour $PM_{2.5}$ standard. Therefore a comparison of the estimated air emissions for VOCs, NOx, and $PM_{2.5}$ to the *de minimis* thresholds was prepared. The Navy prepared a General Conformity Rule Record of Non-Applicability for the proposed action (see Appendix B of this EIS).

4.6.1 Analytical Methods

The analysis calculated air emission estimates at NWS Earle as a result of the proposed action (see Appendix B). Emission source activities include land clearing, grading, demolition, transport and placement of base materials such as gravel, concrete construction, and paving.

The emissions from these construction activities are primarily based on contributions from engine exhaust s (i.e., non-road diesel engines). All of the alternative alignments are assumed to require less than 1 year to complete.

Construction air emission calculations were performed using the following assumptions.

All Alternative Alignments:

- Roads would include gutter edge.
- New road construction would consist of two 13-feet wide lanes with 7-feet wide shoulders.

Alternative Alignment 1:

- This alignment measures approximately 3,379 feet.

Alternative Alignment 2:

- This alignment measures approximately 3,590 feet.

Alignment Alternative 3:

- This alignment measures approximately 3,960 feet.

Alternative Alignment 4:

- This alignment measures approximately 7,181 feet.
- A two-lane bridge would be constructed (concrete) connecting Macassar Road and Lake Earle Road.

4.6.2 Proposed Action

The results of the calculations indicate that with the assumptions indicated above, the criteria pollutant emissions associated with construction of any of the alternative alignments would be insignificant, both at a regional and a local level and do not approach *de minimis* thresholds (see Table 4-12). The General Conformity regulations stipulate that the significance of an action to regional emissions be assessed to assure the proposed activity does not contribute in excess of 10 percent. A comparison of the percent contribution of estimated emissions with the regional baseline emissions demonstrate that the proposed action emissions would be nearly zero.

Operationally, the only emissions of note that would be generated by the proposed action would include mobile source emissions associated with the new tenants of the Laurelwood housing area. However, this population is expected to be derived primarily from the existing regional population, so the emissions are already taken into account in the regional baseline. For this reason, these emissions are not included in the air quality analysis.

Table 4-12 Air Emissions Generated by Alternative Alignments (Tons per Year)

Alternative	VOCs	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Alternative Alignment 1	0.45	0.1.02	2.67	0.31	1.85	0.33
Alternative Alignment 2	0.51	1.04	2.90	0.33	1.29	0.28
Alternative Alignment 3	0.35	0.77	2.15	0.25	0.54	0.16
Alternative Alignment 4	1.16	3.46	9.24	1.06	2.67	0.78
de minimis Thresholds[1]	50[2]	100[3]	100	100	NA[4]	100
Monmouth County Emission Inventory[5]	26,252	186,883	18,971	3,028	9,431	3,669
Percent Contribution[6]	0.00	0.00	0.05	0.04	0.03	0.02

[1]from 40 CFR 93.153
[2]The *de minimis* threshold for VOCs is for inside an ozone transport region.
[3]*de minimis* threshold for Maintenance Area
[4]There is no applicable threshold for PM_{10} because the area is in attainment and it is not a precursor.
[5]USEPA 2001
[6]Percent contribution reflects the percentage of maximum emissions from the action compared to the County Inventory and is provided to demonstrate that the action is not regionally significant.

4.6.3 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. The number of military families residing at NWS Earle is expected to remain level as no significant changes in personnel levels assigned to NWS Earle are anticipated. Therefore, no impacts to air quality would occur.

4.6.4 Summary of Impacts

There would be short-term construction-related air emission increases under the proposed action. Estimates for air emissions vary for each alternative, however, these emission levels would be insignificant. Therefore, there is no action to offset these impacts.

No impacts to air quality would occur under the No Action Alternative.

4.7 NOISE

Generally, noise impacts are considered adverse if they expose sensitive noise receptors to noise levels in excess of applicable standards established in the local noise ordinance. For this EIS, the thresholds of significance apply when: 1) land-based construction equipment is operated during nighttime hours (6:00 PM to 7:00 AM on weekdays or 6:00 PM to 9:00 AM during weekends and federal holidays unless the activities can meet the standards described in the noise ordinance), 2) traffic noise increases significantly over the existing noise level, and 3) noise levels exceed 65 dBA for sensitive noise receptors during daytime hours or 50 dBA during nighttime hours.

4.7.1 Proposed Action

There would be no direct impacts from noise as a result of implementing the proposed action under any of the action alternatives. Under the proposed action, minor, temporary impacts to the

noise environment in the vicinity of the proposed road construction site at NWS Earle would occur, which is an indirect impact. The use of heavy equipment for site preparation and development (e.g., vegetation removal, grading, and back fill) could potentially generate noise levels above average ambient noise levels. Construction activities would primarily occur within the boundaries of NWS Earle, with the exception of some road improvements to Route 34 at the new entrance providing access to the Laurelwood housing area. This noise increase would be expected to occur during the 8-hour workday for a 5-day work week and continue until the completion of the work. Noise levels would be typical of standard construction activities, would cease with the completion of proposed construction activities, and would only occur during normal working hours (i.e., between 7:00 AM and 5:00 PM, Monday through Friday) and not into the sensitive nighttime hours or on weekends. Furthermore, sound levels could be reduced through the use of equipment sound mufflers.

Generally, the average sound level produced by construction activities would range from approximately 70 to 90 dBA at a distance of 50 feet (USEPA 1971). The closest off-base noise receptor is a residential development north of Route 18, approximately 0.13 miles (700 feet) away. This receptor falls outside of the expected area of potential affect for construction generated noise, as described in Section 3.7. For instance, the noisiest piece of construction equipment, piledrivers, would only be expected to encroach on residential areas within 177 feet of the noise source. Therefore, there would be no significant impacts to off-base receptors from construction generated noise. As discussed above, there may be minor, adverse impacts to on-base receptors, but these impacts would be temporary and would be mitigated to further reduce the impact.

There would be a minor increase in traffic noise associated with vehicle trips generated to and from the Laurelwood housing area, which is also an indirect impact. However, since this traffic would be residential and the speed limit would be slow (e.g., 25 mph maximum), the increase in noise levels would not be expected to be significant. Additionally, the access road to the Laurelwood housing units would primarily be utilized by personal vehicles only (e.g., cars, SUVs, light pick-up trucks). Although there may be increased traffic on Route 34 and Route 18 as an indirect impact of the proposed action, the nearest off-base sensitive noise receptor is approximately 0.13 miles (700 feet) away from Route 18 and would likely not be impacted by the proposed action. As described in Section 3.7, traffic noise from a lightly traveled roadway would not be expected to impact noise receptors beyond 100 to 200 feet of the noise source.

4.7.2 No Action Alternative

Under the No Action Alternative, there would be no impacts or changes to the existing noise environment at or in the vicinity of NWS Earle because no construction would take place as proposed under the four action alternatives.

4.7.3 Summary of Impacts

Minor, short-term noise impacts would result from the construction activities associated with the proposed action, regardless of which alternative is selected. To offset these impacts, construction would generally occur during daylight hours and not into the sensitive nighttime hours or on weekends. Furthermore, sound levels could be reduced through the use of equipment sound mufflers. Minor indirect impacts due to traffic noise associated with additional vehicle trips generated to and from the Laurelwood housing area are expected. This traffic would be residential with a speed limit of 25 miles per hour, thereby minimizing the effect to identified receptors.

No impacts from noise would occur under the No Action Alternative.

4.8 CULTURAL RESOURCES

Criteria set forth in 36 CFR Part 800 are used to evaluate the effects of an undertaking on historic properties (i.e., those listed or eligible for listing on the NRHP). The regulation defines an effect as an alternative to the characteristics of a significant cultural resource that qualify it for inclusion on the NRHP. Analysis of potential impacts to significant cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, introduction of visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed.

4.8.1 Proposed Action

As discussed in Section 3.8, archaeological sites/features or isolated artifacts were encountered during studies conducted in October 2007 and February 2008. The Navy submitted the findings of the October 2007 and February 2008 surveys and testing to the SHPO, initiating consultation on the proposed action. In a letter dated January 23, 2009, the SHPO stated that none of the sites are eligible for listing on the NRHP. Quarters A, B, and C, and their associated garages are eligible for the NRHP and are located within the vicinity of Alternative Alignments 2 and 3. The SHPO concurred with the Navy's finding that the proposed action would have no adverse effect to historic properties. Appendix D contains the correspondence between the Navy and the SHPO. If during construction and site grading any additional archaeological resources are discovered, the Installation Commander would be notified and actions in the vicinity halted and the area marked until further archaeological investigations are conducted.

Therefore, there would be no impacts to cultural resources from the proposed action.

4.8.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. An access road would not be constructed, changes to existing infrastructure at the installation would not occur, and

Laurelwood housing units would not be made available to the general public. Therefore, no impacts to cultural resources would occur.

4.8.3 Summary of Impacts

There would be no impacts to cultural resources from the proposed action. In a letter dated January 23, 2009, the SHPO concluded that the proposed action would have no adverse effect to archaeological resources or historic properties (see Appendix D).

No impacts to cultural resources would occur under the No Action Alternative.

4.9 GEOLOGY, TOPOGRAPHY, AND SOILS

Geological impacts would be considered significant if the alternatives would have a potential to result in geological conditions that could result in structural damage on or off site (e.g., inadequate foundation, sinkhole formation, etc.). Impacts on topography and soil would be considered significant if they would cause erosion that would result in an appreciable loss of topsoil.

Impacts to geology, topography and soils from the proposed action would be minor with both long- and short-term effects. There would be a need for grading and earth moving, but in general all the alternative roadway routes would include the use of previously disturbed existing routes in combination with the construction of roadways in new locations. In general, direct impacts would be the loss of soil to erosion during construction and the conversion of soil surfaces to impervious asphalt covered surfaces. Indirect impacts would result from use and maintenance of the road. For example, the use of salt in the winter and possible oil and fuel leaks from cars on the road would contribute to contaminate loads in stormwater runoff that would need to be managed to minimize effects. Short-term impacts would include potential erosion from stock piles and exposed soil surfaces during construction that would need to be minimized with approved erosion and sedimentation control measures (e.g., installation and management of silt fences and other best management practices). Long-term impacts would result from the addition of impervious surfaces and grade changes that would increase the volume and velocity of stormwater run-off.

4.9.1 Proposed Action

Potential impacts to geology, topography, and soils vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

4.9.1.1 Alternative Alignment 1

Alternative Alignment 1 would require approximately 1,800 LF of new pavement and 1,000 LF of upgrades along an existing paved road (Saipan Road). Approximately 160 LF of the new pavement would be on an existing sand road. With the 70 foot right-of-way, this would mean the disturbance of approximately 3.6 acres of previously undisturbed or minimally disturbed soils for

construction of the new road and approximately 0.8 acres of disturbance along the existing roadway right-of-way that would be widened and upgraded. Any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan tailored specifically to the construction site and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District (U.S. Navy 2001). This disturbance would have minor short-term impacts on soils during construction. Due to the relatively flat topography and the use of existing roads, the new road construction would cause only minor long-term impacts to geology, topography and soils.

Alternative Alignment 1 would also require the widening of a one-lane bridge; this area is bordered by wetland soils. Impacts to wetlands are discussed in Section 4.11.3. This action would require grading, excavation and back filling, which may result in increased soil impacts.

Minor short-term and long-term impacts from the proposed roadway construction would be mitigated by the use of best management practices for erosion control such as silt fences, hay bales, and temporary stormwater settling areas. These practices could be employed as needed to minimize soil erosion from the site and to prevent impacts to stormwater leaving the site during construction. For any land disturbance of 5,000 SF or more, the New Jersey Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.) requires that the local soil conservation district (e.g., Freehold Soil Conservation District for NWS Earle) certify a soil erosion and sediment control plan prior to the approval of an application for project development (U.S. Navy 2001).

4.9.1.2 Alternative Alignment 2

Alternative Alignment 2 would require approximately 1,500 LF of new road construction and 1,000 LF of upgrades along an existing paved road (Saipan Road). With the 70 foot right-of-way, this would mean the disturbance of approximately 4.4 acres of previously undisturbed soil for construction of the new road and approximately 1.3 acres of disturbance along the existing roadway right-of-way that would be widened and upgraded. This disturbance would have minor short-term impacts on soils during construction. Due to the relatively flat topography and the use of existing roads, the new road construction would cause only minor long-term impacts to geology, topography and soils.

Alternative Alignment 2 would also require widening and redesign of an existing culvert near the Green Drive cul-de-sac and the widening of a one-lane bridge; both of these areas are bordered by wetland soils. Impacts to wetlands are discussed in Section 4.11.3. These actions would require grading, excavation and back filling, which may result in increased soil impacts.

Mitigation measures and regulatory requirements for Alternative Alignment 2 would be the same as described for Alternative Alignment 1 above.

4.9.1.3 Alternative Alignment 3

Alternative Alignment 3 would require approximately 195 LF of new road construction and 3,200 LF of upgrades to existing paved roads (Gela and Saipan Roads). With the 70 foot right-

of-way, this would mean the disturbance of approximately 3.1 acres of previously undisturbed soil. An estimated 1.6 acres of previously disturbed area would be impacted for proposed upgrades to the existing roadways, which would be widened and upgraded. This disturbance would have minor short-term impacts on soils during construction. Due to the relatively flat topography and the use of existing roads, the new road construction would cause only minor long-term impacts to geology, topography and soils.

Alternative Alignment 3 would require the widening of a one-lane bridge; this area is bordered by wetland soils. Impacts to wetlands are discussed in Section 4.11.3. This action would require grading, excavation and back filling, which may result in increased soil impacts.

Mitigation measures and regulatory requirements for Alternative Alignment 3 would be the same as described for Alternative Alignment 1 above.

4.9.1.4 Alternative Alignment 4

Alternative Alignment 4 would require approximately 3,900 LF of new pavement. Some of this pavement would be on previously undisturbed land while the majority of it would be over existing unpaved sand roads. With the 100 foot right-of-way, this would mean the disturbance of approximately 6.1 acres of previously undisturbed or minimally disturbed soils. An estimated 3.1 acres of previously disturbed area would be impacted for proposed upgrades to the existing roadways, which would be widened and upgraded. This disturbance would have minor short-term impacts on soils during construction. Approximately 3,170 LF of the alignment would continue on existing Macassar where only the installation of fencing would temporarily disturb soils. Due to the relatively flat topography and the use of existing roads, the new road construction would cause only minor long-term impacts to geology, topography and soils.

This alternative requires the crossing of Esperance Road using a bridge. Construction of approach ramps and abutments would be required, which would have short-term construction impacts and long-term alteration impacts to geology, topography and soils. Specific long-term alteration impacts would include disturbance to surface geology and soils through grading and cut/fill, and changing existing topography through construction of berms and backfilling.

Mitigation measures and regulatory requirements for Alternative Alignment 4 would be the same as described for Alternative Alignment 1 above.

4.9.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to geology, topography, or soils would occur.

4.9.3 Summary of Impacts

Impacts to geology, topography, and soils from the proposed action, regardless of which alternative is selected, would be minor. Minor short- and long-term impacts from roadway construction would be offset by the use of best management practices for erosion control. The New Jersey Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.) requires that the local soil conservation district certify a soil erosion and sediment control plan prior to the approval of an application for project development for any land disturbance of 5,000 SF or more. Furthermore, any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District.

No impacts to geology, topography, and soils would occur under the No Action Alternative.

4.10 BIOLOGICAL RESOURCES

Determination of the significance of potential impacts to biological resources is based on: 1) importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resources; 2) proportion of the resource that would be affected relative to its occurrence in the region; 3) sensitivity of the resource to proposed activities; and 4) duration of ecological ramifications. Direct and indirect impacts to biological resources are significant if species or habitats of concern are affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of concern.

Direct impacts to vegetation, wildlife habitat and threatened, endangered and other sensitive species from the proposed action would be those that could occur as a result of disturbance required for the construction of road access and fencing, such as land clearing, grubbing, excavation, filling, or paving within previously undisturbed areas, and fragmentation of habitat. Indirect impacts are the effects on these resources that may occur outside of, but are influenced by, the direct impact.

4.10.1 Vegetation

4.10.1.1 Proposed Action

Potential impacts to vegetation vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

Alternative Alignment 1

Direct impacts to forest would occur in three main areas along Alternative Alignment 1. The construction of a jughandle across from the Main Gate on Route 34 would require the clearing or disturbance of approximately 1.0 acre (out of a total of 1,902 acres at mainside) of mixed oak and black gum deciduous forest within the northwest quadrant of the intersection of Route 34 and Tarawa Road. Between Route 34 and the end of Green Drive, it is estimated that 0.8 acres

(out of a total of 2,594 acres at mainside) of mixed oak upland and red maple/sweet gum forest would be cleared. Between Green Drive and the wastewater treatment plant fields, an estimated 1.9 acres (out of a total of 1,902 acres at mainside) of mixed oak upland deciduous forest would be cleared. The remainder of the alignment follows the existing Gela and Saipan Roads to Stark Road. However, the replacement of the one-lane bridge at Hockhockson Brook would require the clearing of a very small area of forest. Approximately 0.6 acres of mowed, sandy fields at the wastewater treatment plant would be disturbed. Approximately 2.2 acres of vegetation would be cleared between the sandy fields at the wastewater treatment plant and Saipan Road where it enters Stark Road housing area. The installation of fencing along the existing roadways would occur within previously disturbed areas. The area encompassing the security zone surrounding the Laurelwood housing area is approximately 4.7 acres and is made up of maintained turf and mixed hardwoods. There are approximately 1,794 acres of mixed hardwoods at mainside. The greatest impact to any particular plant community would be to mixed hardwoods within the security zone surrounding the Laurelwood housing area. If the entire 4.7 acres were considered mixed hardwoods, the removal would represent 0.26 percent of the total acres of mixed hardwoods at mainside. The total impact to natural vegetation is estimated to be 11.2 acres for Alternative Alignment 1. Overall, this impact, within 9,900 acres of plant communities at NWS Earle (U.S. Navy 2001), is considered minor.

Indirect impacts to vegetation may occur adjacent to areas of direct impacts. These may include the introduction of non-native, invasive plants along the new roadway and into the adjacent forest, impacts from changes in light, temperature and hydrology, damage to vegetation along the roadside from winter deicing treatments, and stormwater runoff effects. Because of the proximity of existing development and roadways, some of these effects are already evident under the existing condition. For example, invasive plants, such as Japanese stilt grass, have been detected in these forest areas and *Phragmites* occurs at the power line crossing.

Mitigation could include minimizing the amount of clearing to the extent practicable and the use of native, non-invasive plants for any ground stabilization or roadside plantings.

Alternative Alignment 2

Direct impacts to forest would occur in two main areas along Alternative Alignment 2. Between Route 34 and the beginning of Green Drive, it is estimated that 0.8 acres (out of a total of 1,902 acres at mainside) of mixed oak, upland forest along a ridge would be cleared. The security zone along Green Drive would encompass approximately 3.8 acres, although much of that area is already open and relatively cleared. From the end of Green Drive the impacts are the same as Alternative Alignment 1. As discussed under Alternative 1, the greatest impact to any particular plant community would be to mixed hardwoods within the security zone surrounding the Laurelwood housing area. That removal would represent 0.26 percent of the total acres of mixed hardwoods at mainside. The total impact to natural vegetation is estimated to be 14.0 acres for Alternative Alignment 2. This impact, within 9,900 acres of plant communities at NWS Earle (U.S. Navy 2001), is considered minor.

Indirect impacts and potential mitigation measures are the same as those described for Alternative Alignment 1.

Alternative Alignment 3

Direct impacts to forest would occur in one main area along Alternative Alignment 3. Between Route 34 and the beginning of Green Drive, it is estimated that 0.8 acres (out of a total of 1,902 acres at mainside) of mixed oak, upland forest along a ridge would need to be cleared before the alignment joins with Gela Road. The remainder of the alignment follows existing Gela and Saipan Roads to Stark Road. Vegetation impacts primarily associated with the security zone in this area would disturb approximately 5.9 acres of maintained turf and mixed hardwoods. The area encompassing the security zone surrounding the Laurelwood housing area is approximately 4.7 acres and is also made up of maintained turf and mixed hardwoods. There are approximately 1,794 acres of mixed hardwoods at mainside. The greatest impact to any particular plant community would be to mixed hardwoods within the security zone along Gela Road and Saipan Road and surrounding the Laurelwood housing area. If the entire 10.6 acres were considered mixed hardwoods, the removal would represent 0.59 percent of the total acres of mixed hardwoods at mainside. The total impact to natural vegetation is estimated to be 11.4 acres for Alternative Alignment 3. This impact, within 9,900 acres of plant communities at NWS Earle (U.S. Navy 2001), is considered minor.

Indirect impacts and potential mitigation measures are the same as those described for Alternative Alignment 1.

Alternative Alignment 4

Direct impacts to forest would occur in one main area along Alternative Alignment 4. Between Route 34 and Lake Earle Road, the alignment would traverse 250 feet of relatively undisturbed oak/pine forest and follow 1,742 feet of a 15-foot wide unpaved sand road. New forest impacts are estimated to be 4.2 acres (out of a total of 2,594 acres at mainside) of oak/pine forest that would need to be cleared to accommodate a widened, paved roadway. The oak/pine forest is upland habitat typical of the Pine Barrens. The alignment then follows existing Lake Earle Road and Macassar Road to Laurelwood Drive. It is anticipated that all road work along these existing paved roads, including the addition of fencing, would occur within already disturbed roadway right-of-way. Vegetation impacts primarily associated with the security zone in this area would disturb approximately 9.7 acres consisting of oak and pine, mixed oak, and mixed hardwoods. Stands of Atlantic white cedar that occur approximately 125 feet or more from the east side of Macassar Road along the power line right-of-way (Figure 3-8) would not be affected. The area encompassing the security zone surrounding the Laurelwood housing area is approximately 4.7 acres and is made up of maintained turf and mixed hardwoods. There are approximately 1,794 acres of mixed hardwoods at mainside. Because much of the required security zone area along Macassar Road is already cleared and maintained, the greatest impact to any particular plant community would be to mixed hardwoods within the security zone surrounding the Laurelwood housing area. That removal would represent 0.26 percent of the total acres of mixed hardwoods

at mainside. The total impact to natural vegetation is estimated to be 18.6 acres for Alternative Alignment 4. This impact, within 9,900 acres of plant communities at NWS Earle (U.S. Navy 2001), is considered minor.

Indirect impacts to vegetation may occur adjacent to areas of direct impacts. These may include the introduction of non-native, invasive plants along the new roadway and into the adjacent forest, impacts from changes in light, temperature and hydrology, damage to vegetation along the roadside from winter deicing treatments, and stormwater runoff effects.

Mitigation could include minimizing the amount of clearing to the extent practicable and the use of native, non-invasive plants for any ground stabilization or roadside plantings.

4.10.1.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to vegetation would occur.

4.10.1.3 Summary of Impacts

Minor direct impacts to natural vegetation would occur during the construction of any of the action alternatives. Minor indirect impacts to vegetation may occur adjacent to areas of direct impacts. These include the introduction of non-native, invasive plants along the new roadway and into the adjacent forest, changes in light, temperature, and hydrology, and damage from road treating chemicals. Measures to offset these minor impacts could include minimizing the amount of clearing to the extent practicable and the use of native, non-invasive plants for any ground stabilization or roadside plantings.

No impacts to vegetation would occur under the No Action Alternative.

4.10.2 Wildlife

4.10.2.1 Proposed Action

Potential impacts to wildlife vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

<u>Alternative Alignment 1</u>

Impacts to forest land described in the previous section on vegetation impacts could result in impacts to bird species. Specifically, minor impacts to resident and migratory birds due to the loss of forage, shelter, and nesting habitat could occur. The loss of larger trees could impact nesting hawk, owl and woodpecker species. Hawks build nests in the canopy of larger trees, and owls and woodpeckers nest in tree cavities. Impacts could be minimized by retaining larger native trees where practicable. Indirect impacts to forest bird communities typically associated with adjacent road systems could include noise, visual impacts, pollution, and collisions with

vehicles. The effects of roadways on resident forest birds would vary with each species and their individual breeding ecology. Birds that delineate their nesting territories using vocalizations (e.g., a majority of the passerines [songbirds]) may avoid roadway edges where they must compete with the noise of the roadway during singing. Therefore, among the avifauna, the effects of noise generated by the roadway would have the greatest impact to passerines inhabiting the areas adjacent to the roadway. These effects would be limited on the proposed residential roadway with estimated average daily vehicle trips of 2,006 (see Table 4-8). Because much of the impact to forest would occur within 1,000 feet of Route 34 and within 2,000 feet of Route 18, both existing sources of roadway disturbance, as well as near other existing residential access roads, additional impacts associated with the small amount of forest impact with this alternative would be minor.

Nesting and foraging areas for grassland bird species may be displaced by loss of grassland habitat associated with Alternative Alignment 1 crossing the mowed sandy fields near the wastewater treatment plant. The relatively small size (less than 3 acres) and disturbed nature of this site, however, limits its value as quality habitat for less urbanized grassland species, such as eastern meadowlark and northern bobwhite. Therefore, loss of this habitat with this alternative would be only a minor impact. Moreover, this alternative would not result in an impact on migratory bird populations.

The addition of security fencing along the new roadway and on the southern perimeter of the Laurelwood and Stark Road housing areas connecting with the existing perimeter fence would effectively enclose an area of approximately 130 acres that contains approximately 85 acres of forested uplands and wetlands and power line grassland/shrubland between the new fence and the northern mainside perimeter fence. Impacts to mammals outside this fenceline could occur due to the loss of habitat and the restriction of movement by the new roadway and security fencing. Specifically, fencing would exclude medium and large size mammals that could not climb through or over or tunnel under fencing; most notably deer. Vehicle collisions along the new road would not occur, however, because these mammals would be excluded from the enclosed area by security fencing. Fencing would affect the movement patterns of these animals and result in fragmentation of their habitat. Increased mortality of mammals located within the 130 acre enclosed area could occur because of vehicle collisions. An indirect effect of excluding deer would be a reduction in grazing of certain vegetation within the enclosed area. Animals using stream corridors would encounter fencing near the small tributary to Hockhockson Brook and those using grassland corridors would encounter fencing on the power line right-of-way off Gela Road.

Because the total acreage of direct impacts to habitat would be minor (relative to the 9,900 acres of diverse habitat at mainside) and the new alignment is located in proximity to existing developed areas, the impact to mammals from loss of habitat would be minor. Habitat fragmentation impacts would occur for larger animals that would no longer be able to access approximately 130 acres of the northern section of mainside. The impact would not be significant, however, considering the mainside administrative area is already enclosed by a perimeter fence and the area affected is largely developed and traversed by roadways.

Furthermore, mainside consists of approximately 9,900 acres of accessible diverse habitat within the existing fenceline. The NWS Earle Game Warden has indicated that the population of deer in the area enclosed by fencing could be controlled by herd thinning as needed (Green 2008).

Herpetofauna could be directly impacted by the destruction or alteration of foraging and breeding habitat, water quality degradation, or the creation of barriers to movement. The installation of new security fencing would create barriers for a small number of herpetofauna, such as larger turtles, that could not crawl through fence openings. No impacts to snakes or frogs would occur as the chain link fence provides adequate openings for these species. The alteration of microclimates through changes in light and temperature, caused by canopy clearing and asphalt paving in previously undisturbed areas, could also indirectly impact herpetofauna. Because total impacts to forest would be minor and much of the new alignment is located in proximity to existing developed areas and roadways, the impacts to upland herpetofauna from this alternative would not be significant.

Temporary impacts to wetland-dependant herpetofauna could occur during construction of the new bridge. Because Hockhockson Brook is classified an FW2 trout maintenance stream, impacts to the tributary crossed by Alternative Alignment 1 at the small bridge north of the sand fields would have to be minimized to ensure that downstream impacts that could affect trout do not occur. Implementation of this alternative would require coordination with NJDFW.

Mitigation for wildlife impacts resulting from enclosure by security fencing of land north of the alternative alignment could involve the identification and translocation of animals that become trapped when the installation of fencing is complete. Sufficient suitable habitat is present on mainside in the immediate area to receive any displaced animals. This activity, if pursued, would be undertaken in coordination with NJDFW and in accordance with applicable regulations and policies. The deer population could be controlled over time via herd thinning which is coordinated by the NWS Earle Game Warden.

Best management practices would be employed during construction to protect habitat for wetland-dependant species. The state of New Jersey's *Stormwater and Nonpoint Source Pollution Control Best Management Practices Manual* outlines measures to minimize site disturbance, promotes the use of low maintenance native landscaping, and emphasizes the protection and avoidance of environmentally sensitive areas.

Alternative Alignment 2

Wildlife impacts that could result, and associated mitigation measures that could be required, with implementation of Alternative Alignment 2 would be the same as those described for Alternative Alignment 1. However, Alternative Alignment 2 requires a new culvert at the end of Green Drive that could result in additional temporary impacts to wetland-dependent herpetofauna during construction.

Alternative Alignment 3

The wildlife impacts that could result with Alternative Alignment 3 would be the same as those described for Alternative Alignment 1 with some exceptions. This alignment traverses less forest area than both Alternative Alignments 1 and 2 because it utilizes existing Gela Road, and security fencing for this alignment would enclose a slightly larger area than these alternatives. Also, this alignment does not require a new culvert at the end of Green Drive.

Mitigation measures for this alternative would be the same as those described for Alternative Alignment 1.

Alternative Alignment 4

Alternative Alignment 4 would have similar but slightly greater impacts to forest birds than Alternative Alignments 1, 2 or 3 because forest impacts would occur in an area of the ROI that is less developed. However, much of the impact to forest would occur less than 2,000 feet from Route 34, an existing source of roadway disturbance. Therefore, additional impacts from the minor forest impacts with this alternative would not be significant.

Nesting and foraging areas for grassland bird species would not be affected with this alternative. Roadway improvements in the vicinity of the grassland/shrubland areas of power line right-of-way on Macassar Road are expected to be undertaken within the previously disturbed area. Moreover, this alternative would not result in an impact on migratory bird populations.

Impacts to mammals could occur due to the loss of habitat and the restriction of movement by the new roadway and security fencing. Increased mortality of small mammals that become enclosed within the fenceline of the new road may occur because of vehicle collisions. Larger mammals, such as white-tailed deer, would be excluded by fencing; therefore collisions would be minimized.

Impacts to mammals resulting from the installation of security fencing would be similar to those described for Alternative Alignment 1, except that the area west of the access road would not be completely enclosed. A habitat corridor providing passage for wildlife would continue to be available via the proposed Esperance Road overpass at Macassar Road and around the northern boundary of the Laurelwood housing area. With Alternative Alignment 4, a greater length of the power line right-of-way, which likely acts as a wildlife corridor, and the adjacent forest would no longer be available to wildlife that cannot pass through, under, or over the fence. Much of the fragmented area is currently developed administrative and housing areas; therefore, this alternative would not fragment high-value habitat.

Because the total acreage of direct impacts to habitat would be minor (relative to the 9,900 acres of diverse habitat at mainside) the new alignment is located in proximity to existing developed areas, and the mainside station is already enclosed by a perimeter fence, the impact to mammals from this alternative would not be significant.

Herpetofauna impacts would be the same as those described for Alternative Alignment 1 but slightly greater because a larger area of forest would be affected. Security fencing may create a barrier to larger individuals, such as some turtles, but would also reduce the possibility of roadway mortality. Because total impacts to forest cover would still be minor and much of the proposed alignment is located in proximity to existing developed areas and roadways, impacts to herpetofauna from this alternative would not be significant. Temporary impacts to wetland-dependant herpetofauna may result during reconstruction of the intersection of Macassar and Esperance Roads, where impacts to forested and emergent wetlands would occur. A loss of wetlands could result in a loss of breeding habitat for amphibians. Because roadway improvements in the vicinity of the power line right-of-way on Macassar Road are expected to be undertaken within the previously disturbed area, direct impacts to wetland-dependant herpetofauna in the wetlands in this area are not anticipated. Installation of fencing along the roadway, which may result in ground disturbance that could generate erosion and sedimentation impacts, may temporarily affect wetland-dependant herpetofauna.

This alignment would not impact trout maintenance waters.

Mitigation for temporary construction impacts would be the same as described for Alternative Alignment 1.

4.10.2.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to wildlife would occur.

4.10.2.3 Summary of Impacts

As a result of road construction and vegetation clearing, minor impacts to wildlife due to habitat loss and alteration would occur under any of the alternatives. Minor impacts from roadway noise on wildlife, particularly birds, would be expected. Impacts to terrestrial wildlife may occur due to the restriction of movement by the new roadway and security fencing. Increased mortality of terrestrial wildlife could occur because of vehicle collisions. Mitigation would involve best management practices to minimize sedimentation impacts to perennial and intermittent streams and wetlands, and to protect habitat for wetland-dependent species.

No impacts to wildlife would occur under the No Action Alternative.

4.10.3 Threatened, Endangered, and Other Sensitive Species

4.10.3.1 Proposed Action

Potential temporary indirect impacts to threatened, endangered, and other sensitive species vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

No state- or federally-listed species were detected or are known to occur within the limits of disturbance of any of the alternative alignments considered in this EIS.

Alternative Alignment 1

Several specimens of what may be the state-listed rare basket oak were found in the vicinity of Alternative Alignment 1 on the northern side of the one-lane bridge at Hockhockson Brook (U.S. Navy 2008d) (see Section 3.10.3). In addition, surveys identified the state-listed imperiled southern twayblade adjacent to one of the potential basket oaks (U.S. Navy 2008d). The nearest potential basket oak and southern twayblade are located approximately 120 feet from the limits of disturbance associated with the proposed action. No other target species listed in Table 3-33 were identified during surveys. Given the distance of the nearest state-listed species to the limits of disturbance for Alternative Alignment 1, no direct impacts would occur. Mitigation to avoid temporary indirect construction impacts would be implemented. This includes the use of best management practices during construction to control soil erosion and sedimentation and to minimize sedimentation impacts on habitat that supports state protected species. The state of New Jersey's *Stormwater and Nonpoint Source Pollution Control Best Management Practices Manual* outlines measures to minimize site disturbance, promotes the use of low maintenance native landscaping, and emphasizes the protection and avoidance of environmentally sensitive areas. Coordination with NJDEP could be undertaken as part of the wetlands permitting process (refer to Section 4.11.3) to ensure the appropriate protections are in place for protected species.

Alternative Alignment 2

The effects of Alternative Alignment 2 are the same as described for Alternative Alignment 1.

Alternative Alignment 3

The effects of Alternative Alignment 3 are the same as described for Alternative Alignment 1.

Alternative Alignment 4

As described in Section 3.10.3, the state threatened Pine Barrens treefrog was heard calling in the distance from the power line right-of-way in the vicinity of Alternative Alignment 4, on the south side of Macassar Road during a preliminary species survey and habitat evaluation undertaken by the Navy on August 16 and 23, September 6, and October 11, 2007. The state endangered New Jersey rush was also confirmed to be present in the vicinity of the power line right-of-way. In addition, a specimen of southern twayblade (state-endangered plant) and Swamp Pink, a federally-listed threatened plant were identified near the stands of Atlantic white cedar to the east of Macassar Road (Figure 3-8). The New Jersey Rush was located approximately 100 feet from the limit of disturbance associated with Alternative Alignment 4 and the Swamp Pink and southern twayblade were located approximately 250 feet from the limit of disturbance associated with Alternative Alignment 4. In addition, the location of four other state-listed plant species known to NWS Earle where re-confirmed (Knieskern's beaked rush, Pale beaked rush,

Pine Barrens reed grass, and Barrett's sedge) (U.S. Navy 2008d). Each of these known species are at least 450 feet from the limits of disturbance associated with the proposed action.

Several adult and immature state-threatened Cooper's hawks were visually identified along Macassar Road in the vicinity of the power line right-of-way. The breeding location (nest) of the adult Cooper's hawk was not identified, however, it is likely within the area where the most vigorous territorial response and calling behaviors were observed (U.S. Navy 2008d). This area encompasses the Atlantic white cedar stands (Figure 3-8) along the power line right-of-way to the east of Macassar Road.

Because roadway improvements at the power line right-of-way on Macassar Road are expected to be undertaken within the previously disturbed areas, direct impacts to these species are not anticipated. However, installation of fencing in this area may result in temporary ground disturbance that could generate erosion and sedimentation, which has the potential to indirectly affect the habitat of identified protected plant species. The preferred habitat for the Pine Barrens treefrog includes open-canopied, shrub dominated ponds with acidic conditions typical of white cedar swamps (U.S. Navy 2007e). This habitat is not likely to be affected. The white cedar stands are located approximately 125 feet or more from the east side of Macassar Road, and there are no pools adjacent to the roadway at the power line crossing.

Mitigation to avoid temporary indirect construction impacts would be implemented. These include the use of best management practices during construction to control soil erosion and sedimentation and to minimize sedimentation impacts on wetland habitat at the power line right-of-way that supports protected species. The state of New Jersey's *Stormwater and Nonpoint Source Pollution Control Best Management Practices Manual* outlines measures to minimize site disturbance, promotes the use of low maintenance native landscaping, and emphasizes the protection and avoidance of environmentally sensitive areas. Coordination with NJDEP could be undertaken as part of the wetlands permitting process (refer to Section 4.11.3) to ensure the appropriate protections are in place for protected species.

4.10.3.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to Threatened, Endangered, and Other Sensitive Species would occur.

4.10.3.3 Summary of Impacts

No state- or federally-listed species were detected or are known to occur within the limits of disturbance of any of the alternative alignments considered in this EIS. No direct impacts to identified state- or federally-listed threatened, endangered, and other sensitive species would occur under the proposed action. Mitigation to avoid temporary indirect construction impacts for each of the four alternatives would be implemented. These include the use of best management practices during construction to control soil erosion and sedimentation in accordance with New

Jersey requirements. Given these conditions, no direct or indirect effects to state- or federally-listed threatened, endangered, and other sensitive species would occur under any of the alternative alignments. Therefore consultation under Section 7 of the Endangered Species Act (16 U.S.C. 1536) is not required.

No impacts to state- or federally-listed threatened, endangered, and other sensitive species would occur under the No Action Alternative.

4.11 WATER RESOURCES AND WETLANDS

4.11.1 Surface Water and Groundwater

Impacts to surface water or groundwater would be considered significant if one or more of the following occur:

- long-term increased inundation, sedimentation, and/or damage to water resources in the ROI caused by project activities, including impervious surfacing that increases and/or diverts rainfall runoff and/or affects its collection and conveyance;
- depletion, recharge, or contamination of a usable groundwater aquifer for municipal, private, or agricultural purposes;
- an increase in soil settlement or ground swelling that damages structures, utilities, or other facilities caused by inundation and/or changes in groundwater level;
- or due to the classification of Hockhockson Brook as a FW2 trout maintenance stream, any actions that would threaten the presence of trout downstream of NWS Earle.

Alternative Alignments 1, 2, and 3 would require some type of stream crossing. Direct impacts would result from disturbances in and around Hockhockson Brook and the addition of impervious surface over the local aquifer. This analysis assumes that the proposed new roadway shoulders would be pervious grass or gravel and that impervious surface would consist of two 13-foot wide paved lanes for a total width of pavement of 26 feet. Indirect impacts are the effects on these resources that may occur separate from, but are caused by, the direct impact such as downstream water quality effects or changes in hydrology.

4.11.1.1 Proposed Action

Potential impacts to surface water and groundwater vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

Alternative Alignment 1

Alternative Alignment 1 would require a stream crossing. This crossing involves the widening of the bridge over Hockhockson Brook. The existing bridge is one lane located on a curve in the

road. The new bridge would be a two-lane bridge located in the same place as the existing structure. It is expected that there may be some minor short-term impacts to water quality due to construction activities near Hockhockson Brook. However, best management practices would be incorporated during construction to minimize potential erosion, runoff, and sedimentation that would affect Hockhockson Brook. Therefore, no impacts to trout downstream of NWS Earle or other off-site water bodies are anticipated.

Alternative Alignment 1 would require the placement of approximately 1.7 acres of new impervious roadway pavement over the groundwater aquifer. Because this represents a minimal portion of the aquifer underlying mainside's 10,000 acres, the impact would be considered a minor long-term impact of this alternative.

Two existing IRP sites are present near this alternative alignment (see Section 3.12.2). Both are located on the west side of Macassar Road south of the Laurelwood housing area (Site 1-Operable Unit 8 and Site 16/F). Roadway widening is not proposed for Macassar Road or Stark Road, therefore, no impacts to groundwater from these sites would occur.

Mitigation could include coordination with NJDFW regarding work along Hockhockson Brook, a trout maintenance stream. Any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan tailored specifically to the construction site and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District (US Navy 2001). This stormwater pollution prevention plan would help to ensure that no impacts to Hockhockson Brook occur.

Mitigation for impacts to groundwater recharge would include the installation of stormwater systems that incorporate onsite stormwater infiltration.

Alternative Alignment 2

The impacts to surface waters and groundwater (and mitigation measures) from Alternative Alignment 2 would be the same as those of Alternative Alignment 1, except Alternative Alignment 2 also includes the widening of an existing culvert on a small tributary of Hockhockson Brook. The existing culvert is small, measuring about 12 inches in diameter. The construction of a new culvert in this location would have minor short-term impacts due to earth moving. Long-term impacts would be beneficial as a larger culvert would decrease the potential of flooding during large storm events. Impacts to wetlands are discussed in Section 4.11.3. Alternative Alignment 2 requires 1.9 acres of new impervious surface, slightly more than Alternative Alignment 1.

Alternative Alignment 3

This alternative would not require work on the existing culvert as described for Alternative Alignment 2, but would still require the widening of the bridge. Thus the impacts to surface waters and groundwater (and mitigation measures) from Alternative Alignment 3 would be the

same as those of Alternative Alignment 1, except Alternative Alignment 3 has less new impervious surface (1.0 acres versus 1.7 acres under Alternative Alignment 1).

Alternative Alignment 4

Alternative Alignment 4 would not have any impacts on surface water as it does not cross any streams or impact any bodies of water.

Alternative Alignment 4 would require the placement of approximately 1.8 acres of new impervious roadway pavement over the groundwater aquifer. Because this represents a minimal portion of the aquifer underlying mainside's 10,000 acres, the impact would be considered a minor long-term impact of this alternative.

Three existing IRP sites are present near this alternative alignment that have the potential to impact groundwater if disturbed (see Section 3.12.2). One is located on the east side of Lake Earle Road (Site 4-Operable Unit 1) and two are on the west side of Macassar Road south of the Laurelwood housing area (Site 1-Operable Unit 8 and Site 16/F). Roadway widening is not proposed for Macassar Road and any changes to Lake Earle Road would not affect the delineated boundaries of Site 4. Therefore, no impacts to groundwater from these sites would occur.

Mitigation for impacts to groundwater recharge would include the installation of stormwater systems that incorporate onsite stormwater infiltration.

4.11.1.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to surface water and groundwater resources would occur.

4.11.1.3 Summary of Impacts

Alternative Alignments 1, 2, and 3 would require stream crossings that would involve improvements to existing structures. In particular, these alternatives involve the widening of the bridge over Hockhockson Brook, a trout maintenance stream. It is expected that there may be some minor short-term impacts to water quality due to construction activities near Hockhockson Brook. However, best management practices would be incorporated during construction to minimize potential erosion, runoff, and sedimentation that would affect Hockhockson Brook. Therefore, no impacts to trout downstream of NWS Earle or other off-site water bodies are anticipated. Any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan tailored specifically to the construction site and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District. All waters in the study area have a 150-foot riparian zone associated with them. Activities in riparian zones including the clearing, cutting and/or removal of vegetation are regulated by the NJDEP under the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13).

No impacts to surface water would occur under the No Action Alternative.

4.11.2 Floodplains

Impacts to floodplains would be significant if development is slated within the FEMA 100-year floodplain when there is a practicable alternative to otherwise locate the development outside the floodplain or without taking action to minimize potential harm to or within the floodplain. FEMA indicates that NWS Earle is an area for which flood zones have not been mapped, and as such, no FEMA 100-year floodplain zones have been designated. Therefore, none of the alternative alignments would impact FEMA 100-year flood zones.

The alternatives would, however, traverse USGS designated, NJDEP published flood-prone areas, which may have a one in one hundred chance per year of being inundated. Although this mapping does not take actual field conditions into account and may or may not be accurate, potential impacts to these areas were assessed and are discussed below.

4.11.2.1 Proposed Action

Potential impacts to floodplains vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

Alternative Alignment 1

Alternative Alignment 1 crosses a USGS designated flood-prone area beginning at its intersection with Gela Road at the wastewater treatment plant, continuing to the intersection of existing Saipan Road and along Saipan Road to the boundary of the Stark Road Housing Complex. The jughandle to be constructed across from the main gate on the west side of Route 34 would be located within a flood-prone area.

All waters in the study area have a 150-foot riparian zone associated with them. Activities in riparian zones, including the clearing, cutting and/or removal of vegetation, are regulated by the NJDEP under the FHACA Rules. Certain permits are available from the NJDEP to conduct limited activities within the regulated riparian zones.

Alternative Alignment 2

The USGS flood-prone area affected by Alternative Alignment 2 is identical to that which is described for Alternative Alignment 1, with the exception of the area off Route 34. This alternative does not include a jughandle. Permit requirements would be the same as Alternative Alignment 1.

Alternative Alignment 3

Alternative Alignment 3 crosses USGS flood-prone areas along Gela Road, just east of Green Drive and also the same areas described for Alternative Alignment 1. Permit requirements would be the same as Alternative Alignment 1.

Alternative Alignment 4

The only flood-prone area traversed by Alternative Alignment 4 is at the power line right-of-way along Macassar Road. Impacts would be limited to the installation of fencing and would occur in a previously cleared area. This activity may not require a permit under the FHACA Rules.

4.11.2.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to floodplains would occur.

4.11.2.3 Summary of Impacts

Each of the alternative alignments would traverse USGS designated, NJDEP published flood-prone areas. Mitigation to offset potential impacts to these areas could occur through compliance with the New Jersey Flood Hazard Area Control Act Rules. Furthermore, alternative alignments would avoid to the extent practicable any development within flood-prone areas.

No impacts to flood-prone areas would occur under the No Action Alternative.

4.11.3 Wetlands

Impacts to wetlands would be significant if project activities result in destruction or modification of delineated wetlands or wetland transition area without mitigation.

Anticipated areas of wetland impacts described for each alternative alignment are based on the limits of cut and fill for road construction and improvements, fence construction, and clearing in the 30-foot security zone. Each alternative alignment has been sited to avoid and minimize wetland impacts when aligned with a recently completed wetland delineation of the project area (U.S. Navy 2007d). Figures 2-1, 2-3, 2-4, 2-5, and 3-12 illustrate the limits of cut and fill, fence location, and security zones. For the purpose of this analysis, delineated wetlands that are encumbered by the proposed cut and fill activities are characterized as permanent impacts to wetlands. Although creation of the security zone would not require any grading or changes to hydrology, the security zone will require that vegetation be cleared to permit clear line of sight. Therefore, forested wetlands encumbered by the 30-foot security zone are also characterized as permanent impacts. Scrub/shrub or emergent wetlands encumbered by the 30-foot security zone may be characterized as temporary impacts. Because the proposed action will require authorization from the NJDEP, impacts to wetland transition areas will need to be considered as well as wetland impacts. In addition, vegetation clearing in a Riparian Zone is limited under the Flood Hazard Area Control Act (NJAC 7:13). If the prescribed allowable limits to Riparian Zone vegetation disturbance are exceeded, Riparian Zone compensation must be provided and would be a condition of approval by NJDEP.

The impacts to wetlands are best estimates at this time based on current preliminary designs for the road alignments and current delineated wetlands. Impacts to wetland transition areas are estimates based on the anticipated wetland resource value. The extent of impacts cannot be finalized until the NJDEP issues a Letter of Interpretation that confirms the wetland delineation in accordance with the FWPA Rules (N.J.A.C. 7:7A, last amended October 6, 2008).

The Navy attended a coordination meeting on 24 April 2008 in Trenton, New Jersey with representatives of the NJDEP to discuss the proposed action, the wetland permitting process, and mitigation requirements and options.

4.11.3.1 Proposed Action

Potential impacts to wetlands vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

Alternative Alignment 1

Permanent impacts to regulated wetlands and State open waters related to road construction and fencing for Alternative Alignment 1 are estimated to be 0.19 acres (see Table 4-13). Permanent impacts to wetlands associated with clearing of vegetation for the 30-foot security zone are estimated to be 1.84 acres. Impacts to wetland transition areas are estimated to be 9.75 acres.

Permitting Feasibility

The FWPA Rules (N.J.A.C. 7:7A, updated October 6, 2008) govern the implementation of the FWPA. Any person engaging in a regulated activity, as described at N.J.A.C. 7:7A-2.2, in a wetland shall first obtain a general permit authorization or an individual freshwater wetlands or open water fill permit. Any person engaging in a regulated activity, as described at N.J.A.C. 7:7A-2.6, in a transition area shall first obtain approval from the NJDEP – Division of Land Use Regulation (DLUR) Program through a transition area waiver or general permit authorization.

General Permit# 10B (GP# 10B) authorizes up to 0.25 acres of impacts to wetlands, transition areas, and State open waters for the construction of one or more new road crossings, the expansion or widening of an existing paved or unpaved road, and related appurtenant structures. However, Alternative Alignment 1 currently exceeds this 0.25 acres limit when impacts to transition areas are combined with the direct impacts to wetlands. In addition, there is no general permit for the installation of fencing within a jurisdictional wetland. Because this alignment proposes impacts to wetlands for fencing, and greater than 0.25 acres of estimated impacts to wetlands and transition areas related to road widening and realignments, a Freshwater Wetlands Individual Permit (FWIP) must be obtained to authorize all of the impacts to wetlands and transition areas for this alignment. The FWIP would authorize impacts related to roadwork, fencing, and clearing within the security zone. It should be noted that a FWIP will only be issued by the DLUR if there is no practicable alternative; if the project will result in the minimum feasible alteration or impairment of the aquatic ecosystem; will not affect a present or documented habitat for threatened or endangered species; and is in the public interest as

determined by the NJDEP (N.J.A.C. 7:7A-7.1). Mitigation of impacts is also a requirement of any FWIP authorization in addition to an alternatives analysis (N.J.A.C. 7:7A-7.15).

Impacts to transition areas will automatically qualify for various transition area waivers. However, some of the transition area impacts will need to be quantified and mitigated for (see Mitigation section below) because a FWIP will be required for the project.

Mitigation

Mitigation for impacts to wetlands and transition areas permitted under a GP# 10B are not currently required. This is not applicable because it is clear that the proposed activities will require authorization under a FWIP. Wetland mitigation is required for impacts to wetlands and State open waters and transition areas authorized under a FWIP.

The current NJDEP regulations under the FWPA Rules regarding wetlands mitigation state that mitigation shall fully compensate for a wetland disturbance by replacing any wetland values and functions lost or disturbed with equal values and functions. Because the proposed impacts are considered a "larger disturbance" (greater than 1.5 acres), the hierarchy of mitigation would be 1) Create, enhance or restore on site; 2) Credit purchase in a wetland bank in the same hydrologic unit or within the service area that includes the disturbance (if built prior to January 1, 1999); 3) Credit purchase in an adjacent hydrologic unit to the disturbance or within the same watershed management area (preferred) or create, enhance or restore on site or off site within the same watershed; 4) Monetary contribution to the Mitigation Council; and 5) Upland preservation.

Wetland creation is generally performed at a ratio of 2 acres of wetland created for each acre of permitted disturbance; restoration is generally performed at a 2:1 restoration to impact ratio; and enhancement is usually calculated at 3:1 restoration to impact ratio. Contribution refers to the donation of money or land. Temporary impacts, lasting less than 6 months, can be restored in-place and in-kind and do not require mitigation.

No mitigation is required for transition area impacts that are waived for access. Mitigation for all other impacts to transition areas is required. This mitigation shall be performed through restoration or enhancement of transition areas carried out on the site of the disturbance to the maximum extent feasible. The FWPA Rules go on to outline options in order of hierarchy—mitigation bank credits, on site restoration and enhancement, monetary donation, land donation, and upland land preservation (N.J.A.C. 7:7A-15.26). The required ratio of mitigation is not identified in the regulations but is presumed to be 1:1.

Alternative Alignment 2

Permanent impacts to regulated wetlands and State open waters related to road construction and fencing for Alternative Alignment 2 are estimated to be 0.20 acres (see Table 4-13). Permanent impacts to wetlands associated with clearing of vegetation for the 30-foot security zone are estimated to be 1.93 acres. Impacts to wetland transition areas are estimated to be 9.68 acres.

Permitting Feasibility

Permitting requirements are the same as those of Alternative Alignment 1.

Mitigation

Wetlands mitigation requirements would be the same as described under Alternative Alignment 1.

Alternative Alignment 3

Permanent impacts to regulated wetlands and State open waters related to road construction and fencing for Alternative Alignment 3 are estimated to be 0.18 acres (see Table 4-13). Permanent impacts to wetlands associated with clearing of vegetation for the 30-foot security zone are estimated to be 2.04 acres. Impacts to wetland transition areas are estimated to be 7.18 acres.

Permitting Feasibility

Permitting requirements are the same as those of Alternative Alignment 1.

Mitigation

Wetlands mitigation requirements would be the same as described under Alternative Alignment 1.

Alternative Alignment 4

Permanent impacts to regulated wetlands and State open waters related to road construction and fencing for Alternative Alignment 4 are estimated to be 0.23 acres (see Table 4-13). Permanent impacts to wetlands associated with clearing of vegetation for the 30-foot security zone on both sides of the alignment are estimated to be 1.08 acres. Impacts to wetland transition areas are estimated to be 6.62 acres.

Permitting Feasibility

Permitting requirements are the same as those of Alternative Alignment 1.

Mitigation

Because wetland impacts are expected to be a "smaller disturbance" (less than 1.5 acres), the hierarchy of mitigation would be 1) credit purchase in a wetland bank in the same hydrologic unit or within the service area that includes the disturbance (if built prior to January 1, 1999); 2) credit purchase in an adjacent hydrologic unit to the disturbance or within the same watershed management area; 3) create, enhance or restore on site or off site; 4) monetary contribution to the Mitigation Council; and 5) upland preservation.

Wetland impacts are summarized for each alternative in Table 4-13. Alternative Alignment 3 would result in the greatest permanent impact to wetlands and Alternative Alignment 4 the least impact. Transition area impacts are estimated to be highest for Alternative Alignment 1 and the least for Alternative Alignment 4.

Table 4-13 Summary of Wetland Impacts

Alignment	Approximate Impacts to Regulated Wetlands	
	Permanent Impacts (acres)	Transition Area Impacts (acres)*
1	2.03	9.75
2	2.13	9.68
3	2.22	7.18
4	1.31	6.62

Note: For the purpose of this analysis, delineated wetlands that are encumbered by the limits of cut and fill are characterized as permanent impacts to wetlands. Delineated wetlands encumbered by the 30-foot security zone are also characterized as permanent impacts since vegetation removal would be considered a permanent impact.

* Alignment 1 transition area includes approximately 1.5 acres of previously disturbed area and 0.25 acres for access not expected to require mitigation. Alignment 2 transition area includes approximately 2 acres of previously disturbed area and 0.25 acres for access not expected to require mitigation. Alignment 3 transition area includes approximately 1.54 acres of previously disturbed area and 0.3 acres for access not expected to require mitigation. Alignment 4 transition area includes approximately 1.75 acres of previously disturbed area and 0.2 acres for access not expected to require mitigation.

4.11.3.2 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. Therefore, no impacts to wetlands would occur.

4.11.3.3 Summary of Impacts

Each of the alternative alignments would result in permanent impacts to wetlands as well as impacts to wetland transition areas. In order to offset impacts to wetlands, planning and design of each alternative alignment was carried out with a commitment to avoid and minimize impacts to wetlands. The Navy would seek appropriate permits through NJDEP for impacts to wetlands that could not be avoided. Wetland mitigation in the form of restoration, creation, enhancement or contribution would be coordinated with NJDEP.

No impacts to wetlands would occur under the No Action Alternative.

4.12 ENVIRONMENTAL HEALTH AND SAFETY

The nature and magnitude of potential impacts associated with hazardous and toxic materials and wastes depends on the toxicity, use, transportation, and disposal of these substances. Factors considered in the impacts assessment were changes in the storage, use, handling, or disposal of hazardous materials, toxic substances, and hazardous materials and associated risk to human health due to direct exposure; risk of environmental contamination; and applicable federal, state, DoD, and local regulations. Factors considered in the impact analysis for safety are increased risk of incidents or potential violation of applicable regulations.

4.12.1 Proposed Action

4.12.1.1 Hazardous/Toxic Materials and Waste Disposal

Hazardous Materials

The proposed action would result in the occupation of all 300 units at the Laurelwood housing area by civilians. Compared to current occupancy levels (less than 5 percent occupied), the amount of residential hazardous materials stored at the housing area would increase. The developer/owner of the Laurelwood housing area would be responsible to ensure that all applicable laws and regulations governing the use, storage, and disposal of hazardous materials are adhered to in accordance with the lease agreement with the Navy.

Requirements for temporary onsite storage and consumption of fuel during the construction of the access road and fence line would be expected. The risk of uncontrolled release of hazardous substances would be minimized through the use of industry accepted methods of storage for fuels and other hazardous materials. Contractors constructing the road and fence line would be required to operate in compliance with applicable federal and state regulations.

Implementation of the proposed action would not result in the addition of any USTs, ASTs, or temporary accumulation points for hazardous substances at NWS Earle.

Toxic Substances

Previous surveys at the Laurelwood housing area determined that there are no asbestos containing materials, lead in dust or soils, PCBs, or radon issues of concern. Therefore, health risks from toxic substances would not be expected.

4.12.1.2 Installation Restoration Program

Alternative Alignments 1, 2, and 3 would access an existing portion of Stark Road near the intersection of Saipan Road as shown on Figures 2-1, 2-3, and 2-4. This portion of Stark Road is adjacent to the boundaries of Site 16 as illustrated on Figure 3-13. In addition, two monitoring wells associated with Site 16 are located approximately 30 feet to the east of Stark Road. No impacts to Site 16 are expected as road improvements to this portion of Stark Road under the proposed action would be minimal, consisting primarily of fence installation. If widening of Stark Road is required, however, width could be added to the northwest side of the road without impacting existing monitoring wells or the boundaries of Site 16. It is not anticipated that this site would represent an area of concern for individuals traveling on this portion of the access road, residents of the Laurelwood housing area, or individuals involved in construction of the access road.

Alternative Alignment 4 would pass in the vicinity of Sites 24 and 25 (Operable Unit 4) and Site 4 (Operable Unit 1) along Lake Earle Road, and Site 47 along Macassar Road (Figure 3-13). The boundaries of each of these sites are well beyond the assumed right-of-way for Alignment 4. It is

not anticipated that these sites would represent an area of concern for individuals traveling on this portion of the access road, residents of the Laurelwood housing area, or individuals involved in construction of the access road. Moreover, Sites 24, 25 and 47 have concurrence on no further action with the USEPA.

Alignment 4 incorporates the entire length of Macassar Road, which bisects the delineated boundaries of Site 1 (Operable Unit 8) (Figure 3-13). The Navy and the USEPA, in consultation with NJDEP, selected the remedy for Site 1 that addresses groundwater contamination, including instituting land use controls. Among the land use controls is a requirement to notify the USEPA and the state of New Jersey in writing 60 days prior to the Navy leasing, transferring, or accessing the property, consult with the USEPA and the state of New Jersey on specific wording for property transfer, sale, or lease documents, and provide USEPA and the state with copies of these documents (U.S. Navy 2004b). As part of the proposed action, the Navy would comply with all land use control stipulations if this alignment is selected. The proposed action would not require Macassar Road to be widened beyond its existing width, and therefore would not intrude into Site 1. The only modifications proposed under Alignment 4 would be the installation of fencing along both sides of the roadway. The Navy's contractor responsible for installing security fencing would coordinate with environmental staff at NWS Earle prior to installation of fencing along the portion of Macassar Road that crosses Site 1. Coordination would involve development of a workplan that complies with established land use controls and avoids human exposure to contamination. It is not anticipated that this site would represent an area of concern for individuals traveling on this portion of the access road, residents of the Laurelwood housing area, or individuals involved in construction of the access road. Restrictions in this area are primarily based upon the use of groundwater in the vicinity of the site. Drinking water for the housing areas is currently provided by a public water supply and is not obtained from onsite wells.

Fencing would be installed around the perimeter of the Laurelwood housing area under the proposed action, thereby segregating the housing from all of these installation restoration sites.

4.12.1.3 Ordnance

Naval Weapons Station Earle fully adheres to the instructions and regulations contained in Ordnance Pamphlet 5, Volume 1, Ammunition and Explosives Safety Ashore (U.S. Navy 2007g). In addition to existing security measures in place at various ordnance areas at NWS Earle, fencing along each of the proposed alignments and around the Laurelwood housing area as part of the proposed action would further prevent unauthorized access to ordnance areas. Housing areas are located outside of all explosive safety quantity distance arcs. Of the four alternative alignments, only Alternative Alignment 4 is encumbered by existing explosive safety quantity distance arcs. As illustrated on Figure 3-14, two arcs associated with the D-Group ordnance operations area encumber the portion of Alternative Alignment 4 between Lake Earle Road and Esperance Road. The remaining D-Group arc is located approximately 420 feet from Alternative Alignment 4. If Alternative Alignment 4 is selected to fulfill the purpose and need for the proposed action, NWS Earle would alter the type and quantity of ordnance at the D-

Group such that existing explosive safety quantity distance arcs no longer encumber the alignment. Given these conditions, significant impacts from ordnance would not occur from implementation of the Proposed Action.

4.12.1.4 Safety

Under the Proposed Action, short-term construction and demolition activities associated with construction of a new access road would take place. It is expected that this activity would be completed in less than one year. During this period the potential for accidents would be increased. The addition of construction-related equipment traffic to roadways and temporary traffic detours could increase the potential for vehicle accidents. Construction sites pose additional risks if not adequately secured.

The responsibility for securing construction sites would belong to the contractor performing the work. Specific practices and policies to protect human health and minimize safety risks would be coordinated between the contractor, the developer of Laurelwood, and the Navy prior to initiation of construction activities. Efforts to offset potential short-term effects to safety would include safety fencing and other specific best management practices and policies required by the contractor performing the construction.

Each alternative alignment is located near an IRP site or sites and short-term use of hazardous materials (e.g., equipment fuel) would be present during construction of the access road. By adhering to regulatory requirements and employing best management practices as they relate to each substance, the proposed action would not cause hazardous materials or wastes to create a significant impact to the environment or represent an area of concern for residents.

Given these conditions, significant impacts to human health and safety are not anticipated from implementation of the Proposed Action.

4.12.1.5 Environmental Justice/Protection of Children

The proposed action would change the demographics of Census Tract 8099.3 in a manner that cannot be reasonably foreseen. In the future, the Census Tract would continue to be comprised of the military personnel and their dependents housed in the other 89 units of Navy-occupied housing at NWS Earle, plus the future residents of the Laurelwood housing area. Even if Census Tract 8099.3 were to remain a low-income and/or minority population as defined in this EIS (see Section 3.12.5), there are no significant environmental and health impacts that would disproportionately impact this population. The significant impacts identified in this EIS relate to impacts to schools and school funding and this impact would not disproportionately impact the population within Census Tract 8099.3.

Potential environmental health and safety risks to children associated with the proposed action are not foreseen. There are no known environmental health and safety risks to which civilians that would occupy the Laurelwood housing area would be exposed. The construction of an unimpeded access road and associated fencing would be in accordance with all applicable

environmental health and safety standards that would provide for the protection of all persons, including children at NWS Earle.

4.12.2 No Action Alternative

Under the No Action Alternative, an access road to the Laurelwood housing area would not be constructed and civilians would not be permitted to occupy housing units at NWS Earle. Baseline environmental health and safety data as well as environmental justice/protection of children data, as described in Section 3.12, would remain unchanged. Therefore, there would be no significant impacts to environmental health and safety or environmental justice/protection of children issues from implementation of the No Action Alternative.

4.12.3 Summary of Impacts

Alternative Alignments 1, 2, and 3 present no impacts to installation restoration sites. However, Alternative Alignment 4 incorporates the entire length of Macassar Road, which bisects the delineated boundaries of Installation Restoration Site 1 (Operable Unit 8). No direct or indirect effects are anticipated to this site from the proposed action. However, this site contains a land use control requirement whereby the Navy must notify the USEPA and the state of New Jersey in writing 60 days prior to the Navy leasing, transferring, or accessing the property. Moreover, the Navy must consult with the USEPA and the state of New Jersey on specific wording for property transfer, sale, or lease documents. The Navy would comply with all land use control stipulations if this alternative is selected to ensure the health and safety of workers during construction and Laurelwood residents. A portion of Alternative Alignment 4 is encumbered by two explosive safety quantity distance arcs. If Alternative Alignment 4 is selected, NWS Earle would alter the type and quantity of ordnance at the D-Group such that existing explosive safety quantity distance arcs no longer encumber the alignment. During the road construction period, the potential for accidents would be increased and the addition of construction-related equipment traffic to roadways and temporary traffic detours could increase the potential for vehicle accidents. Efforts to offset potential short-term effects to safety would include safety fencing and other specific best management practices and policies required by the contractor performing the construction. Under all alternative alignments, there would be no impacts related to Executive Orders for environmental justice and protection of children.

No significant impacts related to environmental health and safety, including Executive Orders for environmental justice and protection of children, would occur under the No Action Alternative.

4.13 SECURITY

Impacts to security would be significant if the proposed action: 1) compromises the ability of NWS Earle security personnel to adequately patrol/protect the installation; or 2) introduces a security threat to the installation that cannot be mitigated with security enhancements and procedures.

4.13.1 Applicable Studies Concerning Security at NWS Earle

4.13.1.1 2003 and 2009 Security Impact Study Using the Risk Analysis Vulnerability Assessment Methodology

In November 2003 the Naval Facilities Engineering Service Center performed a quantitative vulnerability and risk analysis of four alignments considered at that time as potential alternatives to providing unimpeded access to the Laurelwood housing area (U.S. Navy 2003c). However, of the four alternative alignments evaluated, only one alignment (Alternative Alignment 4 of this EIS, but called Alignment 1 in the 2003 study) was ultimately considered in this EIS. Please see Section 2.4 for a discussion of alternatives eliminated from further consideration in this EIS.

In the 2003 Security Impact Study, the Risk Analysis and Vulnerability Assessment Methodology was used to determine the impact on 10 critical assets situated on NWS Earle and selected by the Command for analysis. The potential increases in risk and vulnerability to critical assets/facilities located in the administrative area of the base was assessed. The assessment concluded that Alternative Alignment 4 would have a negligible effect on increasing risk to identified facilities (U.S. Navy 2003c). Installation of passive barriers and access control procedures at perimeter emergency access points were the only countermeasures recommended to ensure the same level of risk is maintained as under the no action alternative (U.S. Navy 2003c). However, the study noted that additional security personnel will likely be required to patrol the additional perimeter fencing (U.S. Navy 2003c).

Because the 2003 Security Impact Study did not evaluate all of the alternatives considered in this EIS, the Navy completed an updated Security Impact Study in January 2009 through the Naval Facilities Engineering Service Center (U.S. Navy 2009). The 2009 study determined the risk and vulnerability to specific installation assets/facilities based on UFC 4-010-01, *DoD Minimum Anti-Terrorism Standards for Buildings*. This UFC specifies common criteria and minimum construction standards to mitigate anti-terrorism vulnerabilities and terrorist threats to buildings. The 2009 study concluded that existing levels of protection would be maintained at the installation should any of the four alternative alignments be implemented if mitigation measures relevant to specific assets/facilities are implemented. Particular mitigation measures cannot be disclosed in this EIS; however, all required security and force protection mitigation measures would be incorporated into the proposed action to maintain full compliance with all regulations and standards discussed in Section 3.13.2.

4.13.1.2 DoD Inspector General Report Concerning 801 On-Base Housing

In August 2008 the DoD Inspector General prepared a report in response to a request by Congressman Christopher H. Smith to review the Section 801 housing contract between the Navy and the developer of the Laurelwood housing area. The report reviewed the security measures the Navy would implement under the proposed action but did not review the sufficiency of proposed security measures. The Inspector General concluded that "Naval Weapons Station Earle officials, in accordance with the terms and conditions of the contract, continue to adequately plan for all the steps necessary for the general public to live on base.

However, Naval Weapons Station Earle officials face an increased security monitoring burden by allowing the general public to reside in Section 801 on-base housing units or the Navy will face costly penalties to negotiate termination of the contract and compensate the contractor for lost revenue during the remainder of the contract period." (Inspector General DoD 2008).

The report discussed six other DoD installations, in addition to NWS Earle, that have Section 801 on-base housing units. As of May 2008, one of those six installations, Fort Wainwright, Alaska, had Section 801 on-base housing units open to the general public. Fort Wainwright erected a security fence around the 400 housing units to segregate them from the main post. A new unimpeded road was constructed to allow the general public to access the housing without passing through a Fort Wainwright security gate. Like the Laurelwood housing area at NWS Earle, the Fort Wainwright Section 801 housing units are located such that they could be easily isolated from the remainder of the base using security fencing. According to the Inspector General report, Fort Wainwright security officials believe the transition to allow the general public to live in the 801 housing area has gone smoothly (Inspector General DoD 2008). Fort Wainwright Security Officials reported that crime decreased on the base after the security fence was placed around the units (Inspector General DoD 2008). The report also noted that Fort Wainwright security officials do not aid the developer in vetting or performing background checks on potential renters (Inspector General DoD 2008). As NWS Earle and Fort Wainwright have different missions and somewhat different security concerns, the provision of access to the 801 housing at Fort Wainwright may not be directly analogous to the provision of access at NWS Earle. However, it does demonstrate successful implementation of the 801 program with housing that was on an installation.

4.13.2 Proposed Action

Potential impacts to security vary between alternatives. Therefore, each alternative alignment is discussed individually in separate sections.

Regardless of which alternative alignment is selected, NWS Earle security forces would continue to enforce the various federal laws that are applicable to civilians on NWS Earle as is the case currently. Naval Weapons Station Earle was acquired under exclusive federal jurisdiction. Therefore, several services typically supplied by the local municipality would continue to be supplied by NWS Earle personnel. One of these services is police enforcement. Laurelwood residents would be subject to applicable state and federal laws and enforcement issues as described in Section 3.13. The level of NWS Earle police involvement would be equal to the potential violation being investigated. With respect to enforcement on the Laurelwood site, none of the alternatives would affect the local municipal law enforcement resources.

Occupants of the Laurelwood housing area would not be provided access to the secure area of the Station as the access route and the Laurelwood housing area would, under each of the four alternative alignments, be entirely fenced off from those areas. However, they would be subject to NWS Earle police enforcement and patrols. In addition, other general policing activities could be undertaken by Station security personnel as required. Therefore, the Laurelwood housing area

would have a degree of Navy security personnel presence not associated with other contiguous civilian housing. The additional security personnel presence would act as an additional deterrent to potential security risks at the Station. As stated previously, the perimeter fence and patrols are only some of the security measures instituted at NWS Earle. Security measures that are in place now provide protection to secure facilities and they would continue to provide protection for these facilities no matter the occupancy of the Laurelwood housing area. Naval Weapons Station Earle would continue to operate in full compliance with all regulations and standards discussed in Section 3.13.2. Furthermore, NWS Earle would continue to implement any enhancements or modifications to NWS Earle's security measures necessary to assure such compliance.

The Navy could also make available, as a service to the Laurelwood housing developer, a security screening for all potential residents and personnel. Due to the terms of the lease, this screening could only be offered to the Laurelwood housing developer; the Navy could not require the developer to utilize it. Likewise, the use of the results would be at the developer's discretion, as under the lease, the developer determines who will live in its housing. This security screening is yet another tool available to ensure the safety and security of the installation if deemed necessary and requested by the developer.

Implementing any of the proposed alternative alignments would involve the establishment of additional physical security requirements. Generally this would involve installing perimeter fencing, perimeter emergency access points, and additional security personnel. The location and amount of fencing as well as the number and location of perimeter emergency access points would be dictated by the specific alternative. Perimeter fencing for all alternatives would be the same as existing perimeter fencing or as indicated by Unified Facilities Criteria 4-022-03. In addition to the fencing, a clear zone both interior and exterior to the fencing would be required. Generally the clear zone would consist of an area approximately 30 feet inside the perimeter and 20 feet on the outside. Within a clear zone the vegetation should not exceed 6 inches in height. In the event an adequate clear zone is not feasible, additional security measures may be instituted. Whatever the final design is for the perimeter fence, the intent would be to maximize security while minimizing potential impacts to natural or man-made resources in the area.

All required security and force protection measures would be incorporated into the proposed action to maintain full compliance with all regulations and standards discussed in Section 3.13.2.

4.13.2.1 Alternative Alignment 1

Alternative Alignment 1 would require approximately 10,373 feet of perimeter fencing to be installed along the southern side of the new road and around most of the exterior of Laurelwood housing. It would extend from the perimeter fence along Route 34 approximately 2,110 feet north of the main gate to the perimeter fence north of Laurelwood housing nearest Route 18 (Figure 2-1). In addition, particular attention to fence design/security requirements would be undertaken at the proposed new bridge over Hockhockson Brook. Installation of this fencing would segregate a portion of the northwest corner of mainside NWS Earle from the remainder of the base. Residents of Laurelwood would not have access to NWS Earle.

New perimeter emergency access points would be installed where the fence crosses Saipan Road and at the intersection of the present perimeter fence just north of the Laurelwood housing area. All gates would be designed and installed in accordance with the Unified Facilities Criteria 4-022-03. Gate operation and usage would be up to the discretion of the Commanding Officer of NWS Earle. However, with regard to the access along Saipan Road, its primary purpose would be to provide access to the housing areas in the event of an emergency, such as fire and rescue. Operation of this access point at these times could either be by remote, operated by the person in the emergency vehicle, or by an advance security person. Access would not remain in an open unmanned/unguarded position. If operated remotely, a security guard would be dispatched to provide security during gate operations.

The perimeter fence installed as part of the proposed action would be patrolled to ensure the integrity of the fence is not compromised. This would be accomplished by a roving security patrol which would drive around the Station at various times during the day and night. The exact schedule and number of trips will not be discussed in this EIS. However, the schedule and numbers of patrol trips would be determined by the Commanding Officer of NWS Earle along with the Head of Security in accordance with applicable regulations/requirements for force protection. This schedule would be dictated by events at NWS Earle and could/would change daily or more often as necessary. As required, a patrol road would be established in association with the construction of the perimeter fence to facilitate the necessary patrols. Exact design and configuration of the patrol road would be determined during design of the new road and the access road, patrol road, and fencing would be accommodated in an approximate 70 foot right-of-way. The intent of any design would be to maintain adequate perimeter security while limiting any potential impacts to wetlands and other natural or man-made resources.

Given the safety and security standards required under the DoD and Navy instructions referenced in Section 3.13.2.1 and the additional security measures available to NWS Earle as described in Section 3.13.2.2, implementing Alternative Alignment 1 would not result in an unacceptable level of security for NWS Earle, nor would implementation of this alternative result in an additional security threat to the surrounding community.

4.13.2.2 Alternative Alignment 2

Security requirements for Alternative Alignment 2 are similar to Alternative Alignment 1 with the exception of an additional 1,440 feet of fencing required for Alternative Alignment 2. Fencing for Alternative 2 would tie into the perimeter fence along Route 34 approximately 1,200 feet north of the main gate, and exclude an additional eight family housing units from the secured portion of the base (Figure 2-3).

Given the safety and security standards required under the DoD and Navy instructions referenced in Section 3.13.2.1 and the additional security measures available to NWS Earle as described in Section 3.13.2.2, implementing Alternative Alignment 2 would not result in an unacceptable level of security for NWS Earle, nor would implementation of this alternative result in an additional security threat to the surrounding community.

4.13.2.3 Alternative Alignment 3

Security requirements for Alternative Alignment 3 are similar to Alternative Alignment 2 except Alignment Alternative 3 would require approximately 775 feet less fencing and would not be located adjacent to the length of Green Drive (Figure 2-4). In addition, Buildings C-27 (Transient Lodge), C-4 (Windjammer Club), and the NWS Earle wastewater treatment plant would be located north of the fence line.

Given the safety and security standards required under the DoD and Navy instructions referenced in Section 3.13.2.1 and the additional security measures available to NWS Earle as described in Section 3.13.2.2, implementing Alternative Alignment 3 would not result in an unacceptable level of security for NWS Earle, nor would implementation of this alternative result in an additional security threat to the surrounding community.

4.13.2.4 Alternative Alignment 4

Unlike Alternative Alignments 1, 2, or 3, Alternative Alignment 4 only segregates the Laurelwood housing area and the access road itself from the secure portion of the Station (Figure 2-5). The other alternatives segregate different portions of the northern part of the installation as well as military housing units. As shown in Figure 2-5, the new access road would extend from its intersection with Route 34 approximately 1,740 feet south of the main gate. Perimeter fencing would run along both sides of the road and completely encompass the Laurelwood housing area.

Implementing this alternative would require approximately 21,897 feet of perimeter fencing, perimeter emergency access points at Coral Road and Stark Road, a new bridge/overpass at Esperance Road, and gates at the railroad just south of the Laurelwood housing area. The perimeter emergency access points at Coral Road and Stark Road would be operated and used at the discretion of the Commanding Officer of NWS Earle. However, their primary purpose would be to provide access to the housing area in the event of an emergency, such as fire and rescue. Operation of this access point at these times could either be by remote, operated by the person in the emergency vehicle, or by an advance security person. The access would not remain in an open unmanned/unguarded position. If operated remotely, a security guard would be dispatched to provide security during gate operations.

The exact configuration of the bridge/overpass at Esperance Road would be determined during final design of the road. This bridge/overpass over Esperance Road would have adequate perimeter fencing along the entrance ramps to the bridge and on the bridge to ensure necessary security. Esperance Road may be depressed slightly to lessen the height of the bridge.

Alternative Alignment 4 would extend across the railroad track just south of the Laurelwood housing area. Therefore, a set of gates would be required in the fence to allow for periodic train traffic. The operation of the railroad gates would be as directed by the Commanding Officer of NWS Earle. Train traffic along this line is limited so the need to open these gates would not be a daily occurrence, but rather on an as-needed basis. It is expected that a security guard would be dispatched to open the gates and secure the opening as long as required for a train to cross the

road. Traffic would be stopped during this time in the same fashion as occurs at all rail "at grade" crossings. The combination of gates and security personnel would ensure that the railroad crossing is secure at all times.

Given the safety and security standards required under the DoD and Navy instructions referenced in Section 3.13.2.1 and the additional security measures available to NWS Earle as described in Section 3.13.2.2, implementing Alternative Alignment 4 would not result in an unacceptable level of security for NWS Earle, nor would implementation of this alternative result in an additional security threat to the surrounding community.

4.13.3 No Action Alternative

The No Action Alternative would maintain the status quo at NWS Earle. Changes to existing infrastructure at the installation would not occur and Laurelwood housing units would not be made available to the general public. No changes to existing security procedures at NWS Earle would occur.

4.13.4 Summary of Impacts

Impacts to security from the proposed action are not anticipated. Numerous DoD and Navy regulations impose requirements to ensure that NWS Earle maintains a certain level of security. These standards continue to apply to the Station, even after the provision of access to the Laurelwood housing area. All required security and force protection measures would be incorporated into the proposed action to maintain full compliance with all regulations and standards discussed in Section 3.13.2. The following specific measures would be implemented to ensure that adequate levels of security are maintained once the Laurelwood housing area is made available to civilians. Perimeter fencing would be implemented along the entire length of the access road as well as surrounding the Laurelwood housing area to segregate this area from the secure portion of the installation. Clear zones would be incorporated into the fence design. Generally the clear zone would consist of an area approximately 30 feet inside the perimeter and 20 feet on the outside. The 20 foot clear zone is achieved by the road shoulder and one traffic lane. Additional security personnel would be implemented as dictated by the specific alternative. Routine security patrols of the access road and the Laurelwood housing area would take place. Additional security measures may be instituted as needed, drawing from the array of measures available as outlined in Section 3.13.2.

No impacts to security would occur under the No Action Alternative.

5 CUMULATIVE EFFECTS

A cumulative impact is the additive or interactive effect on the environment that could result from the incremental impact of the alternatives when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Interactive effects may be either countervailing (where the net cumulative effect is less than the sum of individual effects) or synergistic (where the net cumulative effect is greater than the sum of the individual effects). Cumulative impacts can result from individually minor but collectively significant actions that take place over time. Accordingly, a cumulative impact analysis identifies and defines the scope of other actions and their interrelationship with the alternatives if there is an overlap in space and time. Cumulative impacts are most likely to occur when there is an overlapping geographic location and a coincident or sequential timing of events. Because the environmental analysis required under NEPA is forward-looking, the aggregate effect of past actions is analyzed to the extent relevant and useful in analyzing whether the reasonably foreseeable effects of the alternatives may have a continuing, additive and significant relationship to those effects.

For this EIS, an approach to analyzing cumulative impacts was developed to be consistent with guidance documents issued by CEQ, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997), and USEPA, *Consideration Of Cumulative Impacts In USEPA Review of NEPA Documents*, (USEPA 1999) as well as CEQ's additional Guidance on the *Consideration of Past Actions in Cumulative Effects Analysis* (CEQ 2005). The following approach was used.

- For each resource area addressed in Chapters 3 and 4, the potential for cumulative effects to these resources from the action alternatives in combination with other past, present, or reasonably foreseeable future actions was assessed.

- For those resource areas that were determined to have potential for cumulative effects, an appropriate geographic scope (or geographic study area) was defined for the cumulative impacts analysis for that resource.

- Within the geographic study area for each resource, past, present, or future actions having the potential for additive and/or interactive effects were identified.

- The cumulative impacts of the past, present, and future actions, in combination with the impacts assessed for the alternatives (i.e., Chapter 4) were then assessed. This assessment considered synergistic and countervailing impacts and identified whether the cumulative impacts on resources was adverse or beneficial and minor, moderate, or significant.

5.1 LAND USE

5.1.1 Description of Geographic Study Area

The study area for the analysis of cumulative impacts to land use is the same as that described for the affected environment (see Section 3.1), but is expanded to include the following off-station land uses:

- land use in the Route 34 corridor between Route 547 to the south of the station and Colts Neck Road to the north of the station (within Colts Neck Township, Tinton Falls Borough, Howell Township, Wall Township and Neptune Township), and

- land use in the Route 18 corridor east of the Colts Neck Road junction and west of the Garden State Parkway (within Colts Neck Township).

5.1.2 Relevant Past and Present Actions

Existing land use in the land use study area is the result of past and present development actions and is largely undeveloped wooded or agricultural land. Pebble Creek Golf Club is located northeast of the Route 34/Route 18 junction and the Trump National Golf Club is under construction northwest of the Route 34/Route 18 interchange. There are residential land uses north and south of Route 18 within approximately one mile of the Garden State Parkway, associated with and west of the Trump National Golf Club, and southeast of Route 18 and northwest of NWS Earle where Route 18 turns to the north. Some industrial land use occurs at the intersection of Route 18 and the Garden State Parkway (Colts Neck Township 2004 and Tinton Falls Borough 2007). Along Route 34 and south of the station to Route 547, land use is categorized as highway commercial with some residential north of the interchange and office research south of the station (Wall Township 2005).

5.1.3 Relevant Future Actions

Little change in land use is expected throughout the study area. Along the eastern Route 34 corridor between Route 18 and Colts Neck Road and west of Pebble Creek Golf Club, the Colts Neck Township plans to establish a new neighborhood commercial district. The plan calls for a pedestrian-oriented district consisting of upscale retail stores, restaurants, and business offices (Colts Neck Township 2004). For the area of Route 18 near the Garden State Parkway, Tinton Falls has proposed comprehensive re-planning and development. A key component of this plan is the relocation of the two heavy industrial uses from their existing locations on the north side of Route 18 to a manufacturing zone and industrial office park on the south side of Route 18 north of NWS Earle. Retail would be concentrated in the area north of Route 18 and adjacent to the Garden State Parkway (Tinton Falls Borough 2007). Wall Township plans for the Route 34 corridor to provide opportunities for office space, while Route 33 is intended to provide a retail corridor for the Township (Wall Township 2005).

5.1.4 Cumulative Impact Analysis

The localized changes to land use associated with the proposed action and alternatives would result in no notable changes in land use outside of NWS Earle. Although the future residents of the Laurelwood housing area would be expected to increase demand at nearby retailers and service purveyors (e.g., convenience, grocery, retail stores, automobile service, etc.), such effects would not be at a level of intensity to influence land use development patterns. Existing and future development plans for nearby municipalities provide for ongoing and potential development of such commercial, highway business, public/quasi-public and other land uses that would serve the future residents of Laurelwood housing area.

5.2 SOCIOECONOMICS

5.2.1 Description of Geographic Study Area

The geographic extent of the socioeconomic study area for the cumulative impacts analysis is expanded to include all of Monmouth County, with a particular focus on Colts Neck Township, Tinton Falls Borough, Howell Township, and Wall Township due to their proximity to NWS Earle. Because of the importance of socioeconomic issues in the EIS, the analysis of cumulative impacts incorporates a broader geographic study area and more in depth background on past actions than used for the analysis of other resources.

5.2.2 Relevant Past and Present Actions

5.2.2.1 Population Growth and Urban Development

The past development actions having a great influence on the existing socioeconomic characteristics of the study area relate to the continued population growth and urban development in the area. The greatest rate of population growth in Monmouth County occurred between 1950 and 1970 when the population more than doubled (from 225,327 in 1950 to 461,489 in 1970) (Monmouth County Planning Board 2007). The opening of the Garden State Parkway in Monmouth County in 1954 had a decided influence on the area, as it opened the area to commuting distance from New York City and other areas of New Jersey. From 1950 to 1970, almost 50 percent of population growth in Monmouth County occurred within 3 miles of the Garden State Parkway (Monmouth County Planning Board 2007).

Population growth throughout Monmouth County has been occurring at a more sustainable rate in recent decades, increasing 9 percent from 1970 to 1980, another 10 percent from 1980 to 1990, another 11 percent from 1990 to 2000, and another 3 percent between 2000 and 2006 (see Table 3-1 for details) (U.S. Census Bureau 1993, 2007b, 2007c, 2007d). Since 1990, much of the population growth in Monmouth County has taken place in the western part of the county (Howell Township, Marlboro Township, Freehold Township, and Manalapan Township). These gains in population are fueling increases in local construction and retail trade employment. The strong growth in population and commercial properties has led to accelerating gains in the equalized tax base of the county. (The equalized tax base is the municipal tax rate that would

exist if all property, including public buildings, in the municipality were taxed at 100 percent of true property valuation.) From 1994 to 2007, the equalized tax base in Monmouth County increased by 202.9 percent (Monmouth County Planning Board 2007).

A significant part of the population growth is due to the quality-of-life in Monmouth County that includes strong job prospects in Monmouth County as well as for county residents who commute to other parts of the tri-state region. Additionally, ongoing transportation improvements (including ferry service to Manhattan) provide better access to Monmouth County for commuters and tourists. Many Monmouth County residents work outside of the county, particularly in the finance, insurance, and real estate sector in New York City. Between 1990 and 2000, the number of Monmouth County residents working in Manhattan, Brooklyn, and Staten Island increased by 17.7 percent, 36.4 percent, and 35.7 percent respectively. Many individuals that moved to Monmouth County in the 1990s apparently continued to work at their original places of employment. Between 1990 and 2000, the number of Monmouth County residents working outside of Monmouth County increased by 20.4 percent and the number of non-Monmouth County residents working in Monmouth County increased by 21.7 percent. Home prices in Monmouth County are 54.6 percent higher than in Ocean County. Some Monmouth County residents who move to Ocean County in search of less expensive housing continue to work at their Monmouth County jobs (Monmouth County Planning Board 2007).

Increased use of Route 18 correlates with Monmouth County residents working in Middlesex County, especially in the nearby municipalities of New Brunswick, East Brunswick and South Brunswick. The connection of the Garden State Parkway and Route 287 correlated with improved commutes to Somerset County. Ferry service from Monmouth County to Manhattan has and is expected to continue to affect commuting (Monmouth County Planning Board 2007).

5.2.2.2 Military Presence

The military, both with Fort Monmouth and NWS Earle, has had a historic and ongoing influence on the socioeconomics of the area in terms of local jobs and expenditures. Fort Monmouth is the second largest employer in Monmouth County and NWS Earle is the twelfth largest employer (Monmouth County Planning Board 2007). Information about NWS Earle's economic impact is presented in Section 3.2.5.

The total Fort Monmouth acreage is 1,125 acres, including 667 housing units. Most of the installation (40 percent) is located in Eatontown Borough, 22.6 percent is in Tinton Falls Borough, and 37.5 percent is in Oceanport Borough (Fort Monmouth 2005). In 2007, 9,154 persons were employed at Fort Monmouth: 469 military personnel, 5,476 civilian, and 3,209 private contractors (Kearney 2008).

In 2005, Fort Monmouth's economic impact on New Jersey was measured at $3.24 billion. Direct and indirect jobs in New Jersey in Fiscal Year 2004 attributed to the installation totaled 22,774. The analysis of overall economic impact includes the direct effect of $478.4 million for payroll and benefits received by the employees of Fort Monmouth, as well as the $864.6 million

in contracts awarded by fort organizations to New Jersey companies or to companies of other states for work performed at Fort Monmouth. Along with estimated spending by government travelers to Fort Monmouth, federal impact aid to schools, and estimated private sector pay received by family members of Fort Monmouth employees, direct expenditures from Fort Monmouth to New Jersey amounts to $1.415 billion. The total estimated economic impact of $3.24 billion was obtained by multiplying the direct New Jersey expenditures by a recognized economic multiplier of 2.29 provided by New Jersey (Fort Monmouth 2005).

5.2.2.3 Drawdown of Military Strength at NWS Earle and Fort Monmouth

The drawdown of military strength and ships homeported at NWS Earle since 2000 (see Table 3-2) has had an influence on the demographics, employment, and earnings in the study area. In addition, Fort Monmouth has experienced a steady reduction in military strength since 2004 as shown in Table 5-1.

Table 5-1 Fort Monmouth Military Strength (2002-2007)

	Years					
	2002	**2003**	**2004**	**2005**	**2006**	**2007**
Military Strength	548	626	638	636	492	469

Source: Kearney 2008

5.2.2.4 Reduction in NWS Earle Housing

To correspond with the drawdown of military strength at NWS Earle, the Navy is reducing the number of Navy-occupied units at NWS Earle (i.e., at Stark Road, Green Drive, and Green Acres housing areas). Under the PPV initiative, Navy-occupied housing units are being demolished, renovated, maintained, and managed. The demolition and renovation activities currently underway will conclude with an end state of 89 units (down from 229). As detailed in Table 1-5, the total estimated population of these units (with 100 percent occupancy) would be 383.

5.2.3 Relevant Future Actions

5.2.3.1 Closure of Fort Monmouth

In the 2005 round of Base Realignment and Closure (BRAC) actions, the decision was made to close Fort Monmouth. Accordingly, Fort Monmouth will close no later than 15 September 2011. The majority of the organizations and personnel at Fort Monmouth will relocate to Aberdeen Proving Ground, Maryland and Fort Belvoir, Virginia. A departure schedule for Fort Monmouth organizations has not been established (Fort Monmouth 2005).

The Fort Monmouth Economic Revitalization Planning Authority (FMERPA), a group of elected officials and citizens designated by the State of New Jersey and recognized by the Secretary of Defense, has been established to develop a reuse plan for Fort Monmouth when it closes in 2011. As operations at Fort Monmouth are transferred to Aberdeen, Maryland the base will be redeveloped for government, public, or private use to be determined by the FMERPA in conjunction with the community. The final version of the Fort Monmouth Reuse and

Redevelopment Plan (August 2008) is complete. The Master Reuse Plan has been submitted to the Army and Department of Housing and Urban Development for approval (Gannon 2009).

5.2.3.2 Other BRAC Actions

Another action from the 2005 round of BRAC was the realignment of Naval Surface Warfare Center Division Earle by relocating weapon and armament packaging Research and Development and Acquisition to Picatinny Arsenal, New Jersey. As a result of this action, approximately 68 jobs at NWS Earle would be lost (Defense Base Closure and Realignment Commission 2005, Mahoney 2007).

5.2.3.3 Continued Population Growth and Urban Development

Monmouth County Planning Board has analyzed vacant land, development trends and current zoning in Monmouth County and has predicted that population in the county would rise 0.3 percent per year, reaching 694,189 in 2025. Monmouth County Planning Board asserts that the major factors that generate current growth are sustainable in the near term and will stimulate growth in the long term (Monmouth County Planning Board 2007).

5.2.4 Cumulative Impact Analysis

The downsizing of NWS Earle and closure of Fort Monmouth will have additive impacts, decrease the overall military presence in the region and result in a loss of employment, earnings, and expenditures in related economic sectors. The economic impact of the closure of Fort Monmouth and the loss of the second largest employer in Monmouth County in 2011 will be significant as an individual action. The economics of the region are well diversified which would predict a rapid recovery from the impact from this loss. Implementation of the FMERPA redevelopment plan would likely offset some or all of the economic losses of the Fort Monmouth closure by providing opportunities for businesses and jobs to replace the employment and expenditures of Fort Monmouth. The magnitude of this countervailing impact, however, cannot be reasonably foreseen.

Some interactive impacts with NWS Earle would be anticipated with the Fort Monmouth closure, as there currently is some coordination between mission support and community support functions at NWS Earle and Fort Monmouth. The loss of efficient mission support and community support functionality could result in increased operation and maintenance costs for NWS Earle. In addition, military and dependent personnel and retirees may incur additional costs for products and services that were formerly available at Fort Monmouth through purchase of services and products at local vendors or through increased transportation cost to alternative military providers (e.g., at Naval Air Engineering Station Lakehurst, New Jersey). Local vendors could experience minor increased demand for services formerly rendered at the Fort Monmouth shopping center, commissary, and exchange facilities and Patterson Army Health Clinic.

There would be potential cumulative impacts to the local housing stock, housing tenure, and rental rates as a result of the proposed action in combination with the reuse/redevelopment of

housing at Fort Monmouth, changes to Navy-occupied housing stock at NWS Earle via the PPV initiative, and continued population growth and urbanization in the region.

In terms of social impacts, there would be an additive decrease in the military presence in the region with the closure of Fort Monmouth and downsizing of NWS Earle and an interactive impact with the continued population growth in the area. In comparison to NWS Earle, Fort Monmouth has a higher visibility within the community, a distinction that can be attributed to their respective missions. As military and civilian personnel associated with these installations leave the region, the continued population growth and urbanization in the area add members of the community that are not directly tied to the local military installations. The proposed action and alternatives would have a less pronounced, but incremental impact in this transformation to fewer area residents socially and economically tied to local military installations.

5.3 COMMUNITY SERVICES AND FACILITIES

5.3.1 Description of Geographic Study Area

The geographic study area for community services and facilities cumulative impacts analysis is the same as that analyzed for the proposed action; it includes NWS Earle facilities and services as well as those in the surrounding community. Given the significant impacts of the proposed action and alternatives on Tinton Falls schools, the focus of the cumulative impacts analysis is on education.

5.3.2 Relevant Past and Present Actions

5.3.2.1 On-Station Community Services

Community services at NWS Earle such as child care, youth services, and recreation have been developed to support on-station residents, including those of the Laurelwood housing area. Because of those services, there has been less demand in the past from the Laurelwood housing area residents for such services in the local community.

5.3.2.2 Drawdown of Military Strength at NWS Earle and Fort Monmouth

The drawdown of personnel at NWS Earle in this decade has decreased the demand for community services and facilities both on- and off-station. The reduction in military strength at Fort Monmouth in recent years (see Table 5-1) has also decreased the demand for community services and facilities.

5.3.2.3 Population Growth and Urban Development

This area growth and development detailed in Section 5.2.2.1 has resulted in increasing enrollment in Tinton Falls schools, particularly the elementary and middle schools.

5.3.3 Relevant Future Actions

5.3.3.1 Continued Population Growth and Urban Development

Continued population growth in the area would result in additional impacts on community services, including schools. An article in the December 17, 2008 edition of the *Asbury Park Press* cited a recent demographic study that evaluated growth in the region and the potential impact to the Tinton Falls School District. The article stated that changes in population at NWS Earle (due to the proposed action), reuse of Fort Monmouth, and new residential development in the area could result in a 7.6 percent increase in enrollment in the Tinton Falls Scholl District over current levels in the coming years (Asbury Park Press 2008).

5.3.3.2 Closure of Fort Monmouth

The closure of Fort Monmouth and redevelopment of the installation would be expected to result in a change in use of community services and facilities for the military and civilian personnel and their dependents at Fort Monmouth. The shopping center, commissary, and exchange facilities and Patterson Army Health Clinic at Fort Monmouth also serve NWS Earle military and dependents and retirees in the area (Fort Monmouth 2008).

5.3.4 Cumulative Impact Analysis

There would potentially be interactive impacts to community services and facilities as a result of the combined impact of the closure of Fort Monmouth, ongoing population growth and urbanization, downsizing of NWS Earle, and the proposed action and alternatives. Of these actions, the closure of Fort Monmouth and ongoing population growth would have greater impact than the actions at NWS Earle.

With the closure of Fort Monmouth, there would be a loss of mutual fire and EMS services (including hazardous material incident response) to the local community. This would have additive impacts with population growth and increasing urbanization to result in additional demand for fire and emergency response services in the local community. This could place demand on the NWS Earle fire and emergency response mutual aid services that would be additive to the impacts associated with the service population associated with the proposed action and alternatives.

The loss of Patterson Army Health Clinic at Fort Monmouth would result in a loss of area medical services for military personnel and their dependents. This service population (of military personnel and their dependents) in the area would be reduced by closure of Fort Monmouth and downsizing of NWS Earle and whatever changes occur to the area military retiree population. The proposed action and alternatives, however, would have additive impacts with ongoing population increase in the area, as future Laurelwood housing area residents would rely on community medical services. Local medical services project anticipated future demand and respond accordingly.

The ongoing population growth would be expected to be the largest factor affecting additional demand on police and recreation services. The incremental cumulative impact of the proposed action and alternatives to these services would be minimal.

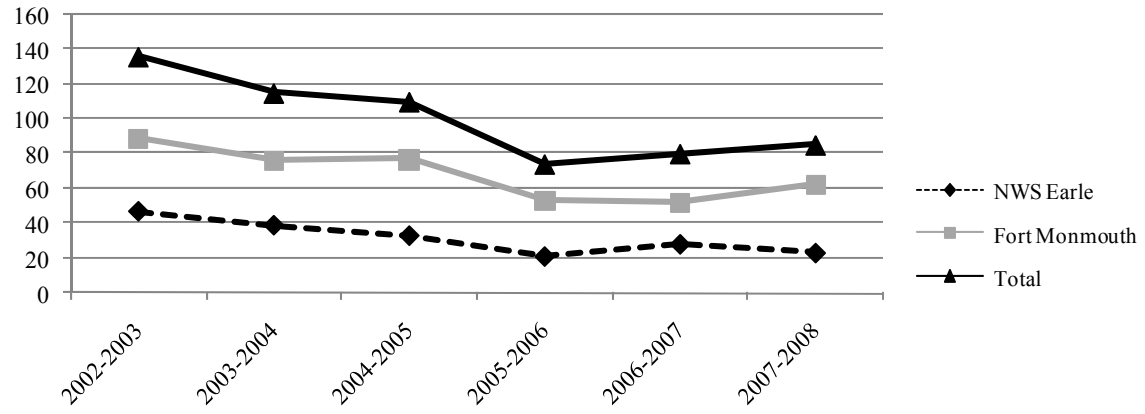
The combined impacts of the downsizing of NWS Earle and closure of Fort Monmouth would result in changes to federally connected school enrollment in area schools, while ongoing population growth has and would be expected to continue to correlate with increasing enrollment in area schools. As discussed in Section 3.3.1.3, the downsizing of NWS Earle has resulted in fewer federally connected students at Tinton Falls schools since 2000.

Whereas Monmouth Regional Board of Education LEA currently receives federal impact aid from federally connected students from Fort Monmouth and NWS Earle, Tinton Falls Board of Education LEA currently receives federal impact aid only from NWS Earle. Table 5-2 lists the federally connected students at Monmouth Regional High School by those associated with NWS Earle and those associated with Fort Monmouth from the 2002-2003 through 2007-2008 school years.

Table 5-2 Federally Connected Students at Monmouth Regional High School (2002-2003 through 2007-2008)

	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	6-Year Percent Change
NWS Earle	47	39	33	21	28	23	-51
Fort Monmouth	89	76	77	53	52	62	-30
Total	136	115	110	74	80	85	-38

Graphical Representation



Source: Webster 2008

As indicated in this table, the number of federally connected students associated with NWS Earle and Fort Monmouth decreased at a combined rate of 38 percent between the 2002-2003 and 2007-2008 school years. The number of students associated with NWS Earle decreased by 51

percent and the number of federally connected students associated with Fort Monmouth decreased by 20 percent. This has resulted in a steady decrease in federal impact aid received by Monmouth Regional Board of Education LEA between 2000 and 2007 (see Table 3-23).

The cumulative impact to the Tinton Falls School District and the Monmouth Regional High School would be additive gains in enrollment of non-federally connected students due to increased population growth in the area, occupation of the Laurelwood housing area, and reuse/redevelopment of housing at Fort Monmouth. These gains would be expected to offset the enrollment losses associated with the closure of Fort Monmouth by 2011. The interactive impact for federal impact aid is that the LEA would educate a similar number of students as in past years, but would receive substantially less federal impact aid due to the drawdown of military personnel at NWS Earle and Fort Monmouth and the closure of Fort Monmouth by 2011. This would be considered an impact.

5.4 TRAFFIC

5.4.1 Description of Geographic Study Area

The geographic area for the analysis of cumulative traffic impacts is bounded on the north by Colts Neck Road, on the east by Hockhockson Road from its intersection with Colts Neck Road south and east to its termination in the town of Macedonia, farther on the east by the Garden State Parkway, on the south by New Jersey Route 33, and on the west by Five Points Road from its intersection with Route 33 north to Colts Neck Road. Route 34 is the main roadway that provides access to and egress from NWS Earle. The installation's main gate is located on Route 34 at the intersection of Esperance Road. Naval Weapons Station Earle Mainside spans four local geopolitical boundaries—(1) Colts Neck Township, (2) Tinton Falls Borough, (3) Wall Township, and (4) Howell Township. All of NWS Earle lies within Monmouth County, New Jersey. The cumulative impacts analysis for traffic for the proposed action encompasses future foreseeable development on the installation, as well as local and regional area development and the area roadway system's ability to accommodate combined traffic increases.

5.4.2 Relevant Past and Present Actions

The military population at NWS Earle increased in the 1990s, which increased traffic in the study area. Since that time, the drawdown of military strength at NWS Earle has steadily reduced the number of vehicles traveling to the study area, while growth in the non-military population and urbanization has increased traffic volumes in the area.

There have been no significant traffic generating developments within the local area in the recent past. In fact, when results from a 2004 traffic study conducted at NWS Earle are compared to the most recent traffic study (U.S. Navy 2008b), the comparison demonstrates that there has been little increase in population and traffic. The 2007 traffic study results did not match the earlier growth projections.

Colts Neck Township has proposed and already implemented several roadway improvement projects in the vicinity of Colts Neck Road and Route 34 that will improve access to the business zone north of Route 18 and improve traffic flow on Route 34 through that area. These projects are likely to have benefits for the proposed action by eliminating existing and anticipated traffic problems in the area.

5.4.3 Relevant Future Actions

Naval Weapons Station Earle mainside currently has one proposed future development project that would have any influence on or would contribute to traffic impacts. Construction of a new main gate is proposed for fiscal year 2009 to include access realignment, new fencing along Route 34, replacement of existing guard house, new countermeasures, new lighting, new vehicle inspection station, and new pass/ID building with new parking lot. This project would alleviate vehicle stacking that sometimes spills onto Route 34 during peak periods. Construction of this project would result in a positive impact to current traffic conditions along Route 34. During the construction period there may be minor delays at the main gate as vehicles continue to be inspected.

The BRAC action described in Section 5.2.3.2 would result in the loss of 68 jobs at NWS Earle, thereby resulting in a reduction in daily vehicle trips. The effect of this action on traffic was factored into the baseline traffic conditions described in Section 4.5.2.

Monmouth County personnel were consulted about forthcoming regional development projects affecting the study area, but they did not identify any specific future projects. Several local development projects are planned for the study area; these were described in the preceding cumulative impacts section on land use (Section 5.1). Continuing population and urban growth would have additive and interactive impacts with the traffic associated with the proposed action and alternative alignments.

The NJDOT has proposed improvements to the intersection of Colts Neck Road and Route 34, which will provide multiple lanes on all approaches, greatly increasing the intersection's capacity. According to the NJDOT and Colts Neck Township staff, these improvements will not be in place during the future year (2010) traffic forecast and are therefore not included in modeling for the proposed action alternatives (see Section 4.5). The improvements would benefit the proposed action by reducing existing and forecasted traffic congestion in that area.

5.4.4 Cumulative Impacts Analysis

Relevant past, present, and reasonably foreseeable future actions affecting traffic in the study area have already been accounted for in the modeling of future (2010) traffic flow for the analysis of the proposed action (Section 4.5). No additional cumulative traffic impacts were identified.

5.5 INFRASTRUCTURE

5.5.1 Description of Geographic Study Area

The geographic study area for utilities and infrastructure encompasses NWS Earle mainside as well as the source locations and disposal or treatment sites of existing utility systems that may occur off station.

5.5.2 Relevant Past and Present Actions

Population growth at NWS Earle and in the local community has contributed and will continue to contribute to an increased demand for utility services and infrastructure. The military population at NWS Earle increased dramatically in the 1990s and then decreased steadily through fiscal year 2007 (see Section 3.2).

5.5.3 Relevant Future Actions

As described in the cumulative impacts section on Socioeconomics (Section 5.2), the population projection for 2025 for Monmouth County is 694,189 which would represent a 9 percent increase from the 2000 level (Monmouth County Planning Board 2007). The population of Colts Neck is projected to increase by approximately 7.4 percent from 2006 to 2025; while the population of Tinton Falls is projected to increase by 20.9 percent from the 2006 population estimate (Monmouth County Planning Board 2006). With the addition of up to approximately 853 residents at Laurelwood, the population of NWS Earle would again increase after 2010.

5.5.4 Cumulative Impacts Analysis

All of the proposed action alternatives would result in an increased demand for utility services, including electricity, telecommunications, natural gas, potable water, wastewater, and solid waste disposal. The proposed action alternatives would also result in increased stormwater discharge from a net increase in impervious surfaces. The increase on demand for these utility services would be compounded by population growth and development of the community surrounding NWS Earle, which would also result in increased demand for these types of services. It is not anticipated that there would be impacts, as the utility service providers would be prepared to meet the demands. As the community grows, utility services would also be expanded as needed. Additionally, as described in Sections 3.4 and 4.4 of this EIS, there are no apparent capacity issues with regard to utility service at NWS Earle.

Cumulative surface water impacts resulting from increased impervious surfaces and disturbance associated with road construction would potentially have additive and interactive impacts with other actions affecting stormwater runoff at NWS Earle and other sources of stormwater runoff impacts to Hockhockson Brook. Please see Section 5.9.4.3, for a discussion of cumulative impacts related to stormwater runoff.

It is anticipated that there would be no cumulative impacts to NWS Earle or key offsite utility service providers' ability to supply the demand for utility services, given the relevant past, present, and future projected population trends. Additionally, the resultant cumulative impact from stormwater runoff is also not expected to be significant.

5.6 AIR QUALITY

5.6.1 Description of Geographic Study Area

The geographic study area for cumulative air impacts is the same as described for direct and indirect air impacts in Section 4.6.

5.6.2 Relevant Past and Present Actions

There are no additional past or present actions occurring simultaneously on or outside of the installation that affect air quality.

5.6.3 Relevant Future Actions

The population commuting to and present at NWS Earle will decline with the expected loss of 68 jobs under BRAC (see Section 5.2.3.2). Outside of installation borders, moderate low-density controlled growth is expected to continue for the foreseeable future. The local planning board has predicted that population in Monmouth County will rise 0.3 percent per year, reaching 694,189 in 2025.

5.6.4 Cumulative Impacts Analysis

No cumulative impacts to air quality are indicated based on past, present and foreseeable future growth.

5.7 NOISE

5.7.1 Description of Geographic Study Area

The geographic study area for cumulative noise impacts includes NWS Earle mainside and the immediate vicinity of the proposed road construction alternatives and Laurelwood housing. Specifically, the affected environment for land-based construction noise encompasses the area within a 177-foot radius of the areas of potential construction associated with providing unimpeded access to the Laurelwood housing area (see Section 3.7, Noise, for a more detailed description).

5.7.2 Relevant Past and Present Actions

The main sources of noise at NWS Earle are associated with vehicular and occasional rail traffic. Route 34, which intersects a portion of the Station, and Route 18, which borders the Station to the north, are the primary sources of traffic noise in the vicinity of NWS Earle. Although no noise data is available for the Laurelwood housing area, the housing area vicinity is typical of a

rural residential area. There are limited sources of unusual noise levels (airports, public rail lines, major manufacturing, interstate highways, etc.) in the nearby community (U.S. Navy, 2004a).

5.7.3 Relevant Future Actions

The population of the local communities is expected to grow (see Section 3.2), which could have some effect on noise levels. However, local noise control ordinances would remain in place to control noise sources resulting from growth of the community.

5.7.4 Cumulative Impacts Analysis

The noise resulting from construction activities for the proposed action and the subsequent increase in traffic noise resulting from occupation of the homes in the Laurelwood housing area would have minor additive impacts with the noise environment in and around NWS Earle. Impacts from construction would only be temporary, and traffic noise associated with the occupancy of the Laurelwood homes is not expected to be significant. Given the relatively small footprint of the average noise levels at NWS Earle and the minor noise associated with implementation of the proposed action alternatives, the resultant cumulative impact would not be significant.

5.8 CULTURAL RESOURCES

5.8.1 Description of Geographic Study Area

The geographic study area for cumulative impacts to cultural resources includes NWS Earle and the immediate vicinity of the proposed road construction area and Laurelwood housing.

5.8.2 Relevant Past and Present Actions

Past use at NWS Earle described in Section 3.8 has influenced the cultural resources present within the study area. Ongoing actions with potential to affect cultural resources on the station are associated with the PPV housing initiative, for which a Finding of No Significant Impact was issued in October 2004. This action would not affect historic properties or properties with archaeological potential.

5.8.3 Relevant Future Actions

No reasonably foreseeable future actions affecting cultural resources have been identified. If actions affecting cultural resources should occur in the future, existing management tools including the HARP and the Cultural Resources Survey Report (U.S. Navy 2007b) would identify such sites and allow for avoidance and proper resource management.

5.8.4 Cumulative Impacts Analysis

Implementation of any of the alternatives, when considered in conjunction with other projects, would have no significant cumulative effect on cultural resources. Although there are historic properties eligible for the NRHP, current or future projects are not expected to disturb those historic properties as future projects would be coordinated with the SHPO per Section 106 (116 U.S.C. 470f) of the NHPA. Whenever effects to historic properties could not be avoided, the effects would be addressed in accordance with the requirements of 36 CFR 800, in consultation with the SHPO, which would reduce effects to less than significant levels. Therefore, no cumulative impacts to cultural resources are expected to occur.

5.9 NATURAL RESOURCES

5.9.1 Description of Geographic Study Area

The study area for the analysis of cumulative impacts to natural resources is the same as described for the affected environment in Section 3, but is expanded to include contiguous areas of the watersheds affected by the proposed action alternatives. The alternative alignments are entirely located within the Hockhockson Brook/Pine Brook sub-watershed with the exception of a small portion of Alternative Alignment 4 at its intersection with Route 34, which would be located on the northern edge of the Mingamahone Brook sub-watershed. These two sub-watersheds, depicted in Figure 5-1, comprise major portions of the total land area of the mainside Station and extend into the area outside the boundaries of the Station.

This analysis considered potential cumulative effects within the whole of the Hockhockson /Pine Brook sub-watershed and within the NWS Earle mainside portion of the Mingamahone Brook sub-watershed.

5.9.2 Relevant Past and Present Actions

Construction of the Stark Road housing area at NWS Earle involved the filling of 3 acres of wetlands within the Hockhockson Brook watershed and the creation of 10 acres of wetlands as mitigation at NWS Earle. Other past and present actions within the study area sub-watersheds include ongoing activities associated with the PPV housing initiative at NWS Earle mainside, the natural resources management projects set forth for the mainside area in the INRMP for 2001-2010, and installation restoration program projects for sites at mainside that are in the process of, or under study for, remedial actions.

Past and present actions within the study area in the surrounding community include agricultural operations, golf courses, and controlled residential, commercial, and industrial development. The location of this development was described in the cumulative impacts section on land use (Section 5.1).

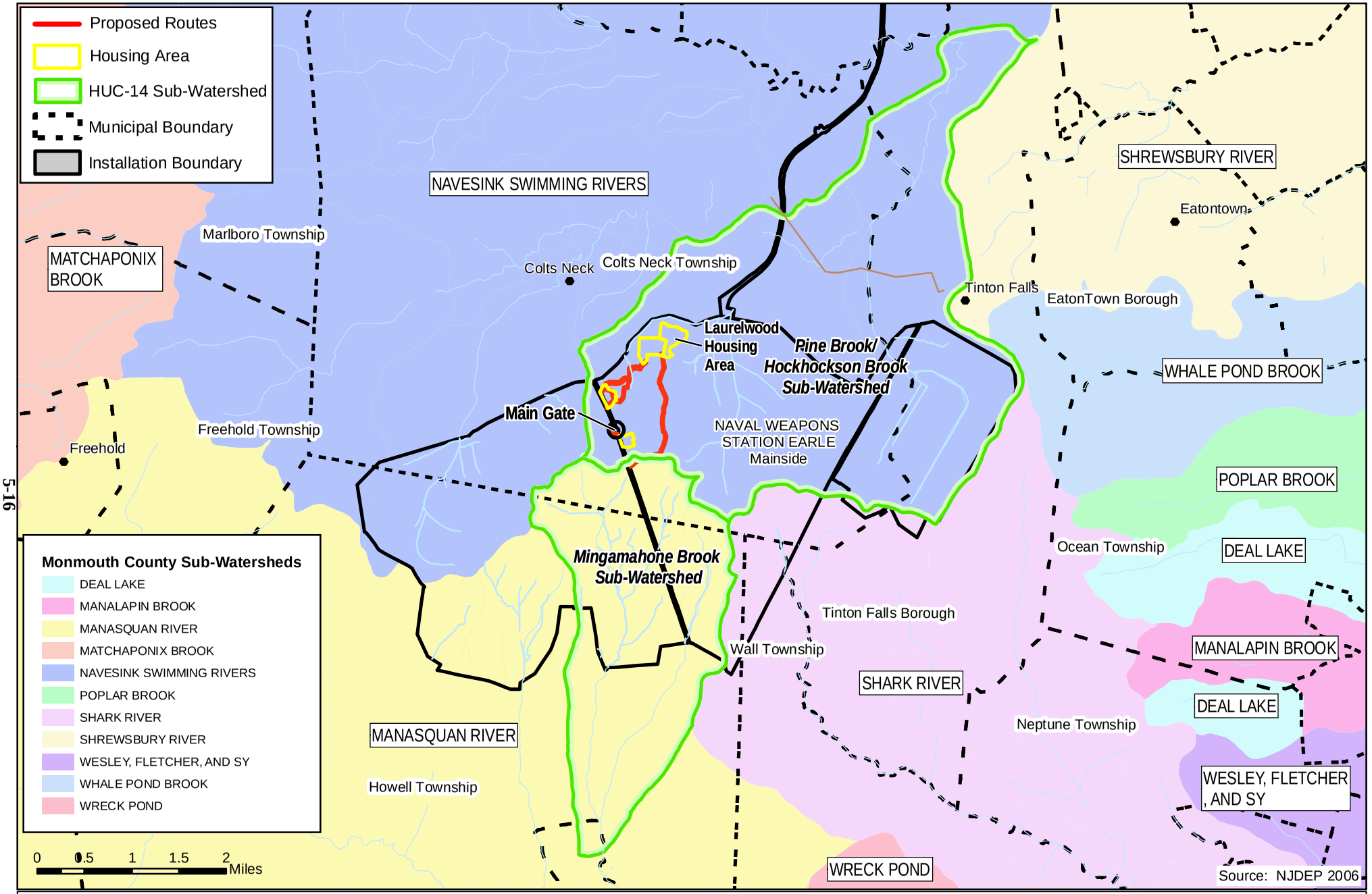


Figure 5-1
Sub-Watersheds in the Vicinity of NWS Earle

5.9.3 Relevant Future Actions

Reasonably foreseeable future actions in the study area include the continuation of present actions at NWS Earle mainside. No additional future projects are planned for the installation. Future actions within the study area in the surrounding area include municipal policies for the preservation and development of agricultural land uses and low density controlled growth in accordance with local zoning and environmental constraints. Planned development was described in the cumulative impacts section on land use (Section 5.1). Development along Route 18, between Route 34 and the Garden State Parkway, would occur in the Hockhockson Brook watershed.

5.9.4 Cumulative Impacts Analysis

5.9.4.1 Geology, Topography, and Soils

The proposed action alternatives would not impact geology or topography; therefore, the analysis of cumulative impacts focuses on soils. Disturbance of soils with the proposed alternative alignments may have a minor additive cumulative impact on soils in the study area when considered in combination with existing and potential soil disturbances from construction or demolition activities of the PPV housing initiative, agricultural land uses, golf course construction and residential and commercial development.

The cumulative impact would be minimized through the use of best management practices and compliance with various state and local regulations and permits.

Natural resources management projects at NWS Earle mainside, including the protection of wildlife habitat and wetlands would have a countervailing effect on soils of the study area sub-watersheds because they help to preserve forest and wetlands. The mainside installation contains most of the forested areas of the study area sub-watersheds. Installation restoration program projects that could disturb soils would be undertaken in coordination with natural resources personnel at NWS Earle to ensure that impacts do not occur (U.S. Navy 2001); therefore, these actions would not contribute to cumulative impacts. Based on the combination of impact minimization and countervailing effects, cumulative impacts on soils would be minor.

5.9.4.2 Vegetation, Wildlife, and Threatened and Endangered Species

No state- or federally-listed species were detected or are known to occur within the limits of disturbance of any of the alternative alignments considered in this EIS. No direct impacts to identified threatened, endangered, and other sensitive species would occur under the proposed action. Therefore the analysis of cumulative impacts focused on vegetation and wildlife in general. Disturbance of vegetation and wildlife habitat with the proposed action alternatives would have a minor additive cumulative impact when considered in combination with disturbances from agricultural land uses, golf courses, and other development. These actions directly alter, fragment, and reduce habitat. Existing roadways were utilized as much as possible for the proposed action alternatives to minimize impacts to these resources; however, security

fencing and a wider roadway would have a minor impact on wildlife (Refer to Section 4.10.2). Golf courses and farmlands degrade natural ecosystems by altering vegetative cover and introducing pesticides and fertilizers. They do, however, provide foraging and movement habitat for certain wildlife, which moderates impacts as compared with the construction of buildings and paved surfaces. Installation restoration program projects, which have the potential to disturb vegetation and wildlife, are not expected to contribute to cumulative impacts because they are undertaken in coordination with natural resources personnel at NWS Earle to ensure that impacts do not occur.

Natural resources management projects outlined in the INRMP, including wildlife habitat improvements, serve as countervailing measures to cumulative impacts on these resources because they help to preserve a substantial amount of forest and wetlands within the study area sub-watersheds. In addition, forested uplands and wetlands at mainside, most notably Hockhockson Swamp, harbor protected and rare species and vegetation communities (e.g. white cedar swamp) that are monitored and protected by the natural resources management projects.

Based on the combination of impact minimization and countervailing effects, the cumulative impact on vegetation and wildlife would be minor.

5.9.4.3 Surface Water and Groundwater

The disturbance of soils and the addition of impervious surfaces with the proposed action alternatives may result in minor additive cumulative impacts to surface water quality, stormwater runoff, and groundwater recharge when added to similar impacts from agricultural land uses, golf courses and other development. The additive affect of the proposed action would be minor because the area of impact is small compared to the area of the sub-watershed and because impact minimization and mitigation measures would be incorporated into the project; these include best management practices and stormwater treatment (refer to Section 4.11.1). The additive effect is also minimized throughout the study area by existing vegetated buffer areas along the streams of the sub-watersheds and wetland buffer areas required by the FWPA. The natural resources that are actively managed by NWS Earle represent a major portion of the study area sub-watersheds, including the headwaters of Hockhockson Brook; successful natural resources management acts as a countervailing effect. Installation restoration program projects would not contribute to cumulative impacts on water resources because they incorporate standards for the protection of surface water and groundwater and groundwater in the immediate vicinity of IRP sites would not be affected by the proposed action alternatives. Based on the combination of impact minimization and countervailing effects, it is expected that cumulative impacts on surface water and groundwater would be minor.

5.9.4.4 Floodplains

Cumulative floodplain or flooding impacts are not anticipated for the proposed action alternatives. Intensive land uses within the study area that include buildings and other impervious surfaces have, for the most part, occurred outside floodplains. Floodplain land uses beyond

riparian buffers are mainly agricultural fields and golf courses where flood damage would not be catastrophic and where there is less runoff from impervious surfaces. The proposed action would be designed according to FHACA Rules (refer to Section 4.11.2) and thus would not result in cumulative flooding impacts within the study area.

5.9.4.5 Wetlands

The proposed action in combination with previous construction of housing at mainside, and other development projects and agriculture in the watershed outside of mainside, results in an additive cumulative impact on wetlands in the Hockhockson Brook sub-watershed. Because mitigation in the form of creation compensates for wetland impacts at mainside and elsewhere, cumulative impacts would be minor and not significant. Similarly, construction projects are required to comply with the FWPA to avoid wetlands or provide compensation for limited unavoidable impacts, thereby reducing the potential for significant cumulative impacts.

5.10 HAZARDOUS MATERIALS AND WASTE

5.10.1 Description of Geographic Study Area

The geographic study area for the evaluation of cumulative impacts concerning hazardous materials and waste includes NWS Earle and the immediate vicinity of the proposed road construction area and the Laurelwood housing area.

5.10.2 Relevant Past and Present Actions

No past or present actions having the potential for additive and/or interactive effects have been identified.

5.10.3 Relevant Future Actions

No future actions having the potential for additive and/or interactive effects have been identified.

5.10.4 Cumulative Impacts Analysis

The current and future management of installation restoration sites identified in Section 3.12.2 would not result in additive and/or interactive effects as no direct or indirect effects to these sites from the proposed action would occur.

5.11 SECURITY

5.11.1 Description of Geographic Study Area

For the purpose of this cumulative impacts analysis, the geographic study area for security primarily includes the physical boundary of mainside NWS Earle within the existing perimeter fence. However, due to the global nature of security issues, this analysis also considers events external to NWS Earle that may affect future security requirements at the Station.

5.11.2 Relevant Past and Present Actions

Several recent events have affected security requirements and operating procedures at NWS Earle. A well-known event is the terrorist attack on the U.S. on September 11, 2001 (9/11). This event changed the way the Navy and the U.S. as a whole view security and potential threats from terrorists. As a result of that event and other terrorist events in the world, security at NWS Earle has become more stringent. The most visible change is the vehicle inspection station located immediately outside the Main Gate. In addition, there is an overall higher level of awareness of security issues throughout the Navy and particularly at NWS Earle. This heightened awareness is demonstrated by the increased time required for an individual vehicle to access the Station due to more detailed vehicle inspections.

A more recent event occurred in May 2007, when six men from New Jersey were arrested in an alleged terror plot against soldiers at Fort Dix, New Jersey. While this did not directly impact NWS Earle, it did impact the security posture at NWS Earle in general. Lessons learned from that event have been provided to personnel throughout the Navy and these lessons learned have been incorporated into security procedures for NWS Earle (see Section 3.13, Security, for additional information).

5.11.3 Relevant Future Actions

Airports and other transportation facilities experience changes in security conditions and protocols based on local actions and/or world events. Similarly, security procedures at NWS Earle are revised based on relevant events occurring both within and outside the Station's boundaries. Depending on the specific event, the increase in security could take the form of increased patrols or changes in vehicle inspection requirements prior to entering the Station. A more extreme example would be what occurred on 9/11 when the Station was closed to all personnel except security and other essential functions.

Naval Weapons Station Earle mainside currently has one proposed future development project that would have a direct impact on the security posture of the installation. Construction of a new main gate and security improvements is proposed for fiscal year 2009 to include access realignment, new fencing along Route 34, replacement of existing guard house, new security countermeasures, new lighting, new vehicle inspection station, and new pass/ID building with new parking lot. Currently, the main gate at NWS Earle uses temporary security measures (e.g., jersey barriers, temporary vehicle inspection facility) as part of its traffic routing and vehicle inspection procedures. This project would implement permanent and enhanced anti-terrorism/force protection measures.

5.11.4 Cumulative Impacts Analysis

The new main gate security enhancements would result in a direct positive impact to the security of the installation. During construction, there would be no reduction in the security posture at the main gate.

Implementing any of the proposed action alternatives would result in some change in security procedures over existing conditions at NWS Earle. At the present time, there are no known future actions, such as new mission changes, potentially occurring at NWS Earle that would require additional security measures in addition to what would occur under existing conditions and under each of the proposed action alternatives. However, security requirements and protocols at NWS Earle are continuously reviewed and adjusted in response to relevant events occurring both within the Station and in the world, as appropriate.

Cumulatively, it is anticipated that there would be no impact to NWS Earle or the local community due to security issues. Enhanced security measures that would be implemented as a result of the proposed action would not result in significant impacts, as increased security would be designed to protect residents of NWS Earle and the local community.

5.12 SUMMARY

The information presented on the analysis of cumulative impacts indicates that the proposed action alternatives when considered with other past, present, and reasonably foreseeable future actions would not, for the most part, result in significant cumulative impacts on human resources. There would be no notable cumulative impacts on land use, traffic, infrastructure, air quality, noise or cultural resources. The economy of the study area would experience additive impacts from military downsizing and the proposed action, but the countervailing effects of local economic development initiatives would likely prevent this from becoming significant. Minor interactive impacts on community services could potentially occur as a result of military downsizing and the proposed action. Potentially significant cumulative impacts on the Monmouth Regional Board of Education LEA and the Tinton Falls School District could occur because of gains in non-federally connected students.

Based on the preceding evaluation, no significant cumulative impacts on natural resources have been identified. Because of the combination of avoidance and minimization of impacts to natural resources associated with the proposed action alternatives, controlled growth and impact minimization practiced by the towns within the study area sub-watersheds, and the countervailing effects of the natural resource management programs at NWS Earle, cumulative impacts on natural resources are expected to be minor.

6 OTHER CONSIDERATIONS

6.1 RELATIONSHIP OF THE PROPOSED ACTION TO FEDERAL, STATE AND LOCAL PLANS, POLICIES AND CONTROLS

A summary of laws, implementing regulations, and executive orders applicable to the action alternatives is summarized herein.

6.1.1 Federal Plans, Policies, and Controls

6.1.1.1 National Environmental Policy Act and Navy Procedures for Implementing NEPA (20 U.S.C. §§ 4321 et seq.)

The NEPA is a basic national charter for protection of the environment. It establishes policy, sets goals, and provides a means for carrying out environmental policy. The NEPA, and the implementing regulations promulgated by the CEQ and the U.S. Navy, requires that environmental information is made available to decision-makers and citizens before making decisions and taking federal actions, and that the NEPA process should identify and assess reasonable alternatives to proposed actions to avoid or minimize environmental effects. This EIS has been prepared in compliance with NEPA and the Navy procedures for implementing NEPA. The Draft EIS will be distributed to appropriate federal, state, and local agencies, organizations, and interested persons. Comments from these agencies and the public will be incorporated into a Final EIS. No action will take place until the Final EIS has been filed with the USEPA and a Record of Decision has been signed by the Navy.

6.1.1.2 National Historic Preservation Act of 1966, as Amended (16 U.S.C. §§ 470 et seq.), and Executive Order 11593 – Protection and Enhancement of the Cultural Environment

The NHPA establishes a comprehensive program to protect cultural resources from adverse effects. The NRHP was established and federal projects having the potential to impact historic or archaeological resources included on or eligible for inclusion on the Register must comply with the requirements of Section 106 (16 U.S.C. 470f) of the Act. Executive order 11593 imposes additional requirements. The Act ensures that the Advisory Council on Historic Preservation (the implementing agency) be consulted on certain impacts on cultural resources and be afforded an opportunity to comment on each project. The governor of each state and territory appoints a SHPO who is responsible for administering cultural resources programs within a given jurisdiction. In New Jersey, the NJDEP, Historic Preservation Office administers cultural programs. Prior to the approval of an expenditure of any federal funds for an undertaking that may affect a NRHP resource, the Navy must initiate consultation procedures with the SHPO in accordance with the NHPA. The Navy has concluded consultation with the SHPO regarding potential effects to several structures that are eligible for the NRHP and isolated archaeological occurrences. The SHPO determined that the proposed action would have no effect on cultural resources.

6.1.1.3 Clean Water Act (33 U.S.C. §§ 1251 et seq.)

The CWA of 1977 is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA regulates the discharge of pollutants from point sources into waters of the U.S. The CWA, as amended in 1987, requires each state to establish water quality standards for its surface waters derived from the amount of pollutants that can be assimilated by a body of water without deterioration of a designated use. The CWA prohibits spills, leaks, or other discharges of oil or hazardous substances into the waters of the U.S. in quantities that may be harmful. Direct discharges of effluents are regulated under numerical limitations contained in NPDES permits issued by USEPA or under state NPDES programs approved by USEPA. The NJDEP administers point source discharges of pollutants through a USEPA-approved NJPDES Program. Indirect industrial discharges of effluent to publically owned treatment works are subject to pretreatment standards promulgated by USEPA and the state. Naval Weapons Station Earle has been issued a NPDES permit for discharge from the installation wastewater treatment plant. Wastewater flows under the proposed action are expected to be well within the permitted capacity of the treatment plant. Section 404 of the CWA requires that all proposed discharges of dredged or fill material into waters of the U.S. be reviewed under the USACE permit program for consistency with the CWA guidelines (see Executive Order 11990 – Protection of Wetlands).

6.1.1.4 Executive Order 11990 – Protection of Wetlands

Executive Order 11990, Protection of Wetlands, was issued to help avoid possible long- and short-term impacts associated with the destruction and modification of wetlands and to avoid direct or indirect support of development in wetlands wherever there is a practicable alternative. Executive Order 11990 requires that federal agencies establish and implement procedures to minimize development in wetlands. Each alternative alignment has been delineated in accordance with the FWPA Rules (N.J.A.C. 7:7A) and NJDEP protocols, which govern wetland protection in the state. Planning and design of each alternative alignment was carried out with a commitment to avoid and minimize impacts to wetlands. The Navy is seeking appropriate permits through NJDEP for impacts to wetlands that could not be avoided. Wetland mitigation in the form of restoration, creation, enhancement or contribution is being coordinated with NJDEP.

6.1.1.5 Executive Order 11988 – Floodplain Management

Executive Order 11988, Floodplain Management, was issued to help avoid possible long- and short-term impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Executive Order 11988 requires that federal agencies establish and implement certain procedures to minimize development in floodplains and if such development is unavoidable to follow established design and construction guidelines. To determine whether a proposed action will occur in a 100-year floodplain, FEMA flood insurance Rate Maps are used. Flood zones have not been mapped by FEMA at NWS Earle. However, the proposed action would traverse USGS designated, NJDEP published flood-prone areas, which may have a one in one hundred chance

per year of being inundated. This mapping does not take into account actual field conditions, thereby affecting accuracy.

6.1.1.6 Coastal Zone Management Act (16 U.S.C. § 1451)

Pursuant to the CZMA of 1972, New Jersey has prepared a federally-approved Coastal Zone Management Plan. Section 307(c) (16 U.S.C. 1456c) of the CZMA requires that and federal activity that directly or indirectly affects any land or water use or natural resource of the coastal zone be consistent to the maximum extent practicable with the enforceable policies of the state's approved Plan. Mainside, NWS Earle is located entirely outside of New Jersey's coastal zone as defined by the CAFRA (N.J.S.A. 13:19 et seq.). The proposed action would not result in any spill-over impacts into the coastal zone.

6.1.1.7 Endangered Species Act (16 U.S.C. §§ 1531 et seq.)

The Endangered Species Act of 1973, as amended, requires that any action authorized by a federal agency shall not jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. Section 7 (16 U.S.C. 1536) of the Act requires that the responsible federal agency consult with USFWS concerning endangered and threatened species under their jurisdiction. This document has been prepared in order to comply with Section 7 requirements. Presence or Absence surveys for targeted federal and New Jersey listed species were conducted in 2008. No state- or federally-listed species were detected or are known to occur within the limits of disturbance of any of the alternative alignments considered in this EIS. No direct impacts to identified threatened, endangered, and other sensitive species would occur under the proposed action. The Navy is not required to formally consult with the USFWS for this particular action, however, the USFWS will be requested to comment on this EIS during the public review period.

6.1.1.8 The Fish and Wildlife Coordination Act (16 U.S.C. 661-667e)

The Fish and Wildlife Coordination Act of 1958 authorizes the USFWS, NMFS, and state agencies (i.e., NJDEP) responsible for fish and wildlife resources to investigate all proposed federal undertakings which would impound, divert, deepen, or otherwise control or modify a stream or other body of water and to make mitigation and enhancement to the involved federal agency. These agencies will be requested to comment on this EIS during the public review period.

6.1.1.9 Clean Air Act (42 U.S.C. §§ 7401 et seq.)

The CAA, as amended, provides for the protection and enhancement of the nation's air resources. To achieve this goal, the CAA established two strategies for setting standards: 1) NAAQS for criteria pollutants; and 2) national emissions standards for individual sources of hazardous air pollutants. In addition, the CAA requires regulation of mobile sources of air emissions and a permit program for stationary sources. Achieving CAA standards is the responsibility of the states. Each state must develop SIPs that outline to USEPA how it will

achieve and maintain standards. Estimations of air emissions for the proposed action show that the criteria pollutant emissions would be insignificant, both at a regional and a local level and do not approach *de minimis* levels. Moreover, the General Conformity regulations stipulate that the significance of an action to regional emissions be assessed to assure the proposed activity does not contribute in excess of 10 percent. A comparison of the percent contribution of estimated emissions with regional baseline emissions demonstrate that the proposed action emissions would be nearly zero. A Record of Non-Applicability to the requirements of the General Conformity Rule of the CAA is attached in Appendix B.

6.1.1.10 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund") (42 U.S.C. §§ 9601 et seq.)

In 1980, CERCLA was passed to provide a "Superfund" for cleanup of sites with uncontrolled releases of hazardous substances. The CERCLA was amended in 1980 by the Superfund Amendments and Reauthorization Act, which also established the Defense Environmental Restoration Act (10 U.S.C. 2701 et seq.). Major responsibility for monitoring compliance with these acts rests with the USEPA. Naval Weapons Station Earle was listed on the National Priority List in 1990 with 67 individual contaminated sites. The installation has established a Restoration Advisory Board to promote community awareness and obtain constructive community review and input on cleanup and restoration actions. The DoD established the IRP in 1980 to identify, characterize, and remediate environmental contamination on military installations resulting from hazardous waste management practices. Five installation restoration sites are located adjacent to the Laurelwood housing area or along the alternative alignments. One site (Site 1: Operable Unit 8) near Alternative Alignment 4 contains a land use control requirement whereby the Navy must notify the USEPA and the state of New Jersey in writing 60 days prior to the Navy leasing, transferring, or accessing the property. Moreover, the Navy must consult with the USEPA and the state of New Jersey on specific wording for property transfer, sale, or lease documents. The Navy would comply with all land use control stipulations if Alternative Alignment 4 is selected. The Navy would comply with all land use control stipulations if Alternative 4 is selected and continue to limit the use of groundwater in this area.

6.1.1.11 Executive Order 12898 – Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, was issued to focus the attention of federal agencies on human health and environmental conditions that disproportionately affect minority and low-income communities. This EIS has determined that there would be no impacts that would disproportionately impact a minority or low-income population.

6.1.1.12 Executive Order 13045 – Protection of Children from Environmental Health Risks and Safety Risks

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was issued to ensure the protection of children. Federal agencies shall identify and assess

environmental health risks and safety risks that may disproportionately affect children. This EIS has determined that there would be no impacts that would disproportionately impact children.

6.1.2 State Plans, Policies, and Controls

6.1.2.1 New Jersey Fair Housing Act (N.J.S.A. 52:27 D-301)

The New Jersey Fair Housing Act of 1985 requires municipalities in New Jersey to provide for affordable housing. In what became known as "Mt. Laurel Housing," the New Jersey Supreme Court, Southern Burlington County v. Mt. Laurel Township, 92 N.J. 158 (1983), held that all municipalities have a constitutional obligation to provide their fair share of low and moderate income housing, including a portion for their indigenous poor living in deficient housing. The New Jersey Legislature enacted the Fair Housing Act to implement the Mt. Laurel decision. The Act established the Council on Affordable Housing and authorized it to define housing regions and estimate the present and prospective need for low and moderate income housing at the state and regional level. Additionally, the Council was mandated to set criteria and guidelines for municipalities to determine their own fair share, to adjust the number where applicable, to phase in their housing obligation and, if desired, to transfer some of that housing to a willing municipality through negotiations. The Council on Affordable Housing adopted its revised third round rules and methodology in May 2008 (New Jersey Department of Community Affairs 2009).

Colts Neck Township's Housing Element and Fair Share Plan of the Master Plan (Colts Neck Township 2004) includes military family housing units at NWS Earle as part of the housing stock characteristics (which are based on the 2000 Census). However, NWS Earle was not included in the fair share plan to meet the Township's affordable housing obligation. Currently, a low-income family is defined by median household income levels at 60 percent of the median household income for the area. A moderate-income family is defined by median household income levels at 80 percent of the median household income for the area. Affordable housing rents in Colts Neck Township for a 2-bedroom unit are $882 a month for a low-income family and $1,049 a month for a moderate income family; for a 3-bedroom unit, the rents are $980/month for a low-income family and $1,440 a month for a moderate-income family. No 1-bedroom units are currently in the Township's affordable housing inclusion. These rental rates are far below what the developer of Laurelwood projects to charge during the outlease period (starting around $1,590 a month for the 1-bedroom unit) (Laurelwood Homes LLC. 2008). In order for Laurelwood to possibly be included as affordable housing in the future, the developer would likely need to be subsidized (Anfuso 2008). Section 6.1.3.1 discusses how affordable housing is addressed in the Colts Neck Township Master Plan.

6.1.2.2 Water Supply Management Act (N.J.S.A. 58:1A-1 et seq.)

The Water Supply Management Act allows the New Jersey Division of Water Supply to identify and manage areas where water resources are threatened by area development. In 1985, the state recognized serious depletions in the major groundwater aquifers of parts of Monmouth County

and designated this area a "critical water supply area." Allocations were imposed on major groundwater users in the region, and further development of those critical aquifers has been discouraged (U.S. Navy 1987). Potable water supply for the Laurelwood housing area would be purchased from the New Jersey American Water Company as is done currently in accordance with New Jersey requirements.

6.1.3 Local Plans, Policies, and Controls

6.1.3.1 Colts Neck Township Master Plan

The proposed action would have conflicts with the objectives of local land use plans, policies, and controls. This would be an extension of the existing inconsistencies between the Colts Neck Township Zoning and existing land use at NWS Earle. The Colts Neck Township Master Plan goals are to preserve the rural and scenic character of the Township, to preserve a viable agricultural industry, to preserve environmentally sensitive features, to preserve and expand non-agricultural open space, to preserve water resource functions, to support diverse housing types at appropriate scales, to allow the carrying capacity of natural systems to determine development densities, limit public sewer and water infrastructure, to support commercial uses in the existing business zones, and to support existing and evolving patterns of development (Colts Neck Township 2004).

The Colts Neck Township has zoned NWS Earle as Agriculture District or "AG" Zone. However, NWS Earle, including the Laurelwood housing area, is under Exclusive Federal Jurisdiction, and therefore local zoning rules do not apply. Colts Necks' plan for agricultural areas is consistent with the statewide policies for agriculture published in the State Development and Redevelopment Plan as well as the Monmouth County Farmland Preservation Plan. In general, the Township's plan for agricultural areas is to promote agriculture and retain farmland by utilizing planning and innovative land conservation techniques, protection the economic vitality of the agricultural industry, and advising residents on the benefits and special needs of agriculture. The intent of the Agricultural District is to establish very low residential densities to minimize conflicts between farming operations and residential housing. The Township has enacted 10-acre zoning that allows lots to be subdivided at an overall density of one unit per 10 acres (Colts Neck Township 2004).

The Colts Neck Master Plan includes a provision that states the intent of the Township should NWS Earle be closed; the intent of the Township would be to have the station's future use determined by the Township under its Master Plan and zoning authorities. The Master Plan states that it assumes that multifamily housing will be demolished, contamination addressed by the federal government, and all environmentally sensitive areas will be avoided in future use of the site (Colts Neck Township 2004).

The Mount Laurel II Supreme Court Decision, New Jersey Fair Housing Act and the Council on Affordable Housing have issued two rounds of affordable housing obligations, which Colts Neck has met (Anfuso 2007). The Colts Neck Township meets the goal for high density housing in the

southwestern corner of the Township and through Regional Contribution Agreements (Colts Neck Township 2004). The Master Plan calls for locating the higher density residential areas in the southwestern corner of the Township (A-4 and A-6 Residential Zones) to implement the Township's affordable housing allocation. The A-4 Residential District is "The Grande" development, completed in 1995 and the A-6 Residential District is planned for an approximately 39-acre area near Route 18 and Colts Neck Road (Colts Neck Township 2004). As noted in Section 6.1.2.1, new rules have recently been proposed for the third round of affordable housing obligations and the Township is in the process of determining what actions it plans to take in order to comply with the third round of Council on Affordable Housing requirements (Anfuso 2007 and 2008).

Additionally, NWS Earle's wastewater and potable water utilities are inconsistent with the Colts Neck Township Master Plan. The Master Plan goal is to have residential and non-residential developments restricted to lot sizes and density limits based on groundwater resources and the ability of the soil to sustain onsite sewage disposal. The Master Plan calls for limiting utility services to the A-4 and A-6 Residential Zones in the southwest corner of the Township. These services are intended to be limited to what is needed to service the low and moderate income housing in this area (Colts Neck Township 2004).

6.1.3.2 Tinton Falls Borough School District

The impact to Tinton Falls School District would be inconsistent with the current long range facilities plan for the district's elementary and middle schools. The policy of the school district is to prepare demographic studies to project and plan for growth. The impact of the Laurelwood housing area has not been incorporated into Tinton Falls School District plans for annual budget or physical needs (Sydney-Gens 2008).

6.2 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS AND CONSIDERATIONS WHICH OFFSET ADVERSE EFFECTS

There are short-term minor effects associated with construction activities for the proposed action, common to each alternative. These include alteration of topography and soils, sedimentation, increased air emissions, and increased noise. Additional unavoidable effects and mitigation or considerations which offset these effects are described below.

6.2.1 Land Use

Implementing Alternative Alignments 1, 2, or 3 would result in minor effects to land use at the Green Drive and Stark Road housing areas. Functionality would decrease relative to the other portions of the base. Furthermore, the secluded, residential land use character of the Green Drive community would be affected. Mitigation to offset the minor effect at Green Drive could involve planting screening vegetation to create a natural barrier between the new road and existing housing units. Under Alternative Alignment 3, Buildings C-27, C-4, and the wastewater treatment plant would be located outside the fence line, reducing their functionality with the administrative and support facilities at mainside. The minor effect to Green Drive and Stark

Road housing areas and Buildings C-27, C-4, and the wastewater treatment plant due to a decrease of functionality could not be mitigated.

6.2.2 Community Facilities and Services

Significant impacts are anticipated at the Mahala F. Atchison Elementary School, Swimming River Elementary School, and Tinton Falls Middle School as a result of increased school-age children being sent to these schools under the proposed action. Specific impacts include physical capacity impacts, class size increases, additional school bus costs, and the potential need for additional faculty. Mitigation that could potentially offset effects to less than significant levels would include additional Federal Impact Aid funding from the U.S. Department of Education (if available or applicable to civilian students residing at NWS Earle) or redistricting of students. Redistricting could occur within a particular district, or agreements put in place between districts to distribute children into schools that have adequate capacity.

6.2.3 Utilities

Utility demand would increase over existing levels at NWS Earle under the proposed action. There may be impacts to the supply of one or more utilities to the Laurelwood housing area due to inadequate infrastructure on the installation. These impacts are offset by utility upgrades that could be implemented on base. The proposed action would result in a net increase in impervious surfaces due to construction of the access road to the Laurelwood housing area. The net increase in impervious surfaces would result in an associated increase in stormwater discharge volumes and intensities. These impacts are offset by existing adequate stormwater discharge infrastructure at the installation.

6.2.4 Traffic and Transportation

The proposed action would result in localized, short-term on-station impacts to traffic from construction activities. During the period of effect, action would be taken to offset this impact by notifying the NWS Earle population about detours and delays as appropriate. Minor impacts to Stark Road residents (under Alternatives 1, 2, and 3) and Green Drive residents (under Alternatives 2 and 3) would result from additional vehicle trips associated with the Laurelwood housing area. Vehicle speeds would be limited to 25 miles per hour and focused within the morning and peak hours. Under Alternative Alignments 2 and 3, a moderate effect is expected in the form of a slight degradation in the existing level of service for the northbound Route 34 approach to the alignment entrance. This impact would be offset through an adjustment to the signal timing at the Route 34/Esperance Road traffic signal. Under Alternative Alignment 4 an effect is expected in the form of delays at the intersection of Route 34 and Esperance Road. This impact would be offset by a dedicated northbound right-turn lane, and separate left- and right-turning lanes. The proposed action would have a minor impact on the Route 34 and Colts Neck Road intersection, which experiences significant delays. However, the traffic associated with the proposed action would only represent between one and two percent of the overall volume at that intersection.

6.2.5 Air Quality

There would be short-term construction-related air emission increases under the proposed action. Estimates for air emissions under the proposed action demonstrate that these emission levels would be insignificant. Therefore, there is no action to offset these impacts.

6.2.6 Noise

Minor, short-term noise impacts would result from the construction activities associated with the proposed action. To offset these impacts, construction would generally occur during daylight hours and not into the sensitive nighttime hours or on weekends. Furthermore, sound levels could be reduced through the use of equipment sound mufflers.

6.2.7 Cultural Resources

As discussed in Section 3.8, archaeological sites/features or isolated artifacts were encountered during studies conducted in October 2007 and February 2008. The Navy submitted the findings of the October 2007 and February 2008 surveys and testing to the SHPO, initiating consultation on the proposed action. In a letter dated January 23, 2009, the SHPO stated that none of the sites are eligible for listing on the NRHP. Quarters A, B, and C, and their associated garages are eligible for the NRHP and are located within the vicinity of Alternative Alignments 2 and 3. The SHPO concurred with the Navy's finding that the proposed action would have no adverse effect to historic properties. Appendix D contains the correspondence between the Navy and the SHPO. If during construction and site grading any additional archaeological resources are discovered, the Installation Commander would be notified and actions in the vicinity halted and the area marked until further archaeological investigations are conducted.

6.2.8 Geology, Topography, and Soils

Impacts to geology, topography, and soils from the proposed action would be minor. Minor short- and long-term impacts from roadway construction would be offset by the use of best management practices for erosion control. For any land disturbance of 5,000 SF or more, the New Jersey Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.) requires that the local soil conservation district certify a soil erosion and sediment control plan prior to the approval of an application for project development. Furthermore, any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District.

6.2.9 Vegetation

Minor impacts to natural vegetation would occur during the construction of any of the action alternatives. Measures to offset these minor impacts could include minimizing the amount of clearing to the extent practicable and the use of native, non-invasive plants for any ground stabilization or roadside plantings.

6.2.10 Wildlife

As a result of road construction and vegetation clearing, minor impacts to wildlife due to habitat loss and alteration would occur under any of the alternatives. Minor impacts from roadway noise on wildlife, particularly birds, would be expected. Impacts to terrestrial wildlife may occur due to the restriction of movement by the new roadway and security fencing. Increased mortality of terrestrial wildlife could occur because of vehicle collisions. Mitigation would involve best management practices to minimize sedimentation impacts to perennial and intermittent streams and wetlands, and to protect habitat for wetland-dependent species.

6.2.11 Surface Water

Alternative Alignments 1, 2, and 3 would require stream crossings involving improvements to or relocation of existing structures. In particular, these alternatives involve the widening of a bridge over Hockhockson Brook, a trout management stream. Efforts to offset impacts to streams would include coordination with the NJDFW regarding work along Hockhockson Brook. Any construction activity disturbing 1.0 acre or more of land requires development of a stormwater pollution prevention plan tailored specifically to the construction site and filing of a construction activity general stormwater permit application with the Freehold Soil Conservation District. All waters in the study area have a 150-foot riparian zone associated with them. Activities in riparian zones including the clearing, cutting and/or removal of vegetation are regulated by the NJDEP under the FHACA Rules.

6.2.12 Floodplains

Each of the action alternatives would traverse USGS designated, NJDEP published flood-prone areas. Mitigation to offset potential impacts to these areas would occur through compliance with the New Jersey FHACA Rules. Furthermore, alternative alignments would avoid to the extent practicable any development within flood-prone areas.

6.2.13 Wetlands

Each of the alternative alignments would result in direct and indirect impacts to wetlands. In order to offset impacts to wetlands, planning and design of each alternative alignment was carried out with a commitment to avoid and minimize impacts to wetlands. The Navy is seeking appropriate permits through NJDEP for impacts to wetlands that could not be avoided. Wetland mitigation in the form of restoration, creation, enhancement or contribution is being coordinated with NJDEP.

6.2.14 Environmental Health and Safety

Alternative Alignment 4 incorporates the entire length of Macassar Road, which bisects the delineated boundaries of Installation Restoration Site 1 (Operable Unit 8). No direct or indirect effects are anticipated to this site from the proposed action. However, this site contains a land use control requirement whereby the Navy must notify the USEPA and the state of New Jersey in

writing 60 days prior to the Navy leasing, transferring, or accessing the property. Moreover, the Navy must consult with the USEPA and the state of New Jersey on specific wording for property transfer, sale, or lease documents. The Navy would comply with all land use control stipulations if this alternative is selected. During the road construction period, the potential for accidents would be increased and the addition of construction-related equipment traffic to roadways and temporary traffic detours could increase the potential for vehicle accidents. Efforts to offset potential short-term effects to safety would include safety fencing and other specific best management practices and policies required by the contractor performing the construction.

6.2.15 Security

Impacts to security from the proposed action are not anticipated. However, the following measures would be implemented to ensure that adequate levels of security are maintained once the Laurelwood housing area is made available to civilians. Security fencing would be implemented along the entire length of the access road as well as surrounding the Laurelwood housing area to segregate this area from the secure portion of the installation. Clear zones would be incorporated into the access road. Generally the clear zone would consist of an area approximately 30 feet inside the perimeter and 20 feet on the outside. Routine security patrols of the access road and the Laurelwood housing area would take place. Additional security lighting, increased fence height or intrusion detection systems may also be implemented.

6.3 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term uses of the environment associated with the alternatives include changes to the physical environment and energy and utility use during the construction of the road. Construction would involve short-term increases in fugitive emissions and construction-generated noise and would increase the use of fossil fuels to power equipment. In addition, expenditures of public and private funds and the use of labor would be required. Long-term changes would include the alterations to land use that would exist for the life of the road (through 2040).

Implementation of the proposed action would bring long-term productivity at NWS Earle by not hindering the Navy's mission execution. If the proposed action is not implemented the Navy would be in breach of the lease agreement at the termination of the in-lease period. Under this circumstance, the Navy would be required to compensate the developer in an amount equal to the developer's right to use or occupy the Laurelwood housing area for what would have been the remaining useful life of the housing. Compensation to the developer represents a substantial financial obligation to the Navy that could otherwise be used to further the objectives of the installation's mission.

6.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of those resources have on future generations. Irreversible commitments of resources are those that cannot be reversed except over an extremely long

period of time. These irreversible effects primarily result from destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened and endangered species or the disturbance of a cultural site).

Under all action alternatives, there would be irreversible and irretrievable commitment for construction activities in the consumption of construction materials and fossil fuels for road and fence construction. Particular irreversible and/or irretrievable impacts that would result are noted below.

- Consumption of fossil fuels and energy would occur during construction activities. Fossil fuels (gasoline and diesel fuel) would be used to power construction equipment and vehicles. Electrical power would be used for lighting and operations. The energy consumed for project construction and operation represents a permanent and nonrenewable commitment of these resources.

- Commitment of construction materials (asphalt, concrete, fence materials in particular) for construction of the road. These materials would be irretrievably committed for the life of the project. Use of these materials represents a further depletion of natural resources. Construction activities are considered a long-term nonrenewable investment of these resources. However, in 2040, the out-lease period ends and the road and fencing (as well as the Laurelwood housing area) would be demolished. Some of these materials could be recycled, thereby extending the utility of the resource.

- Land that would be physically altered by construction would be committed to the new use for the foreseeable future and would represent a permanent commitment of the land to a developed use and decrease the amount of open land available for other uses.

- The capital and labor required for construction would be an irreversible and irretrievable commitment of these resources.

In addition to the resources expended during construction, there would be consumptive use of certain nonrenewable energy resources, time, and money required to provide ongoing security and maintenance for the road alignment and the Laurelwood housing area.

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APPENDIX A

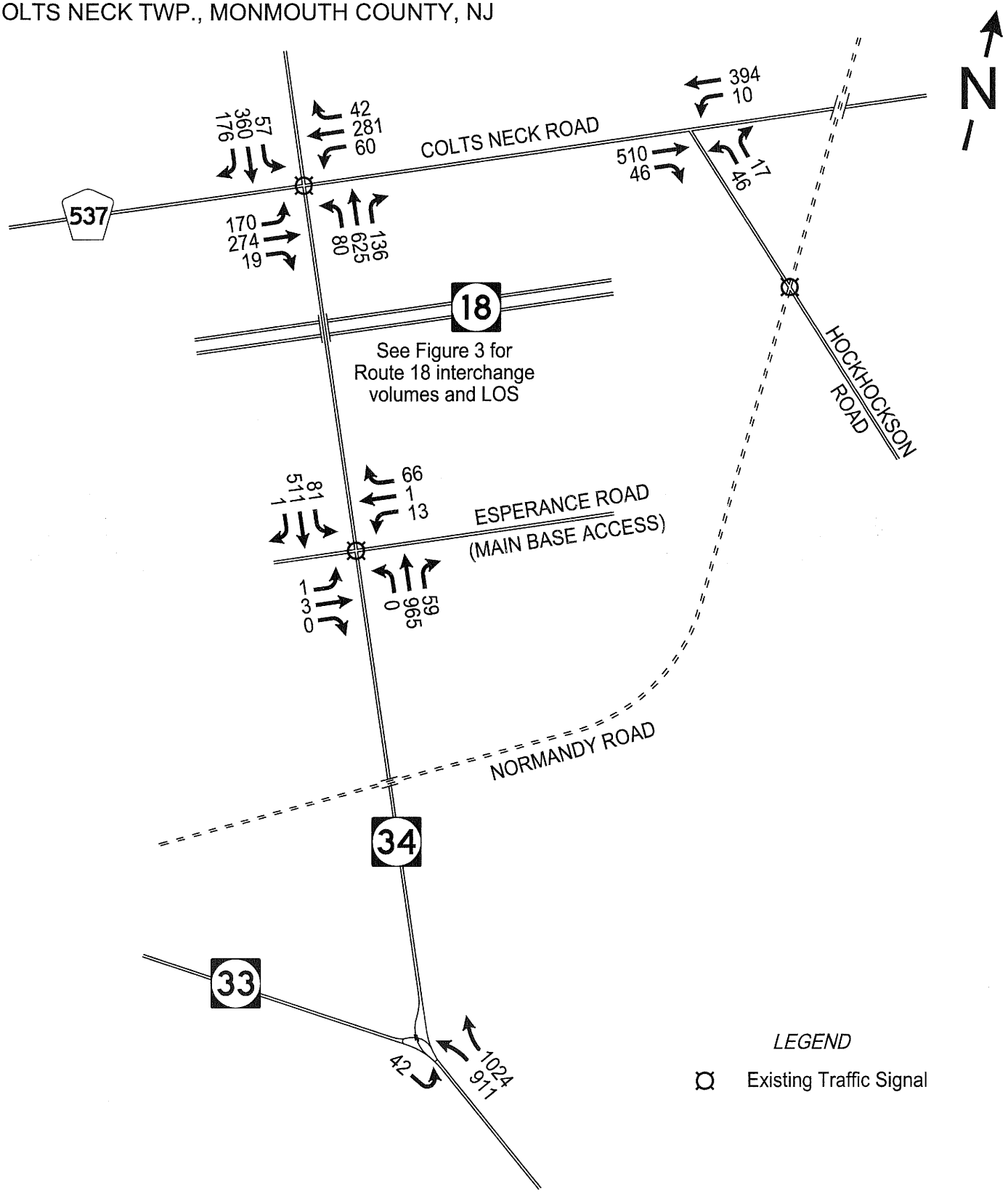
TRAFFIC ANALYSIS

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 1

Existing Weekday Morning Peak Hour Traffic Volumes
November, 2007

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

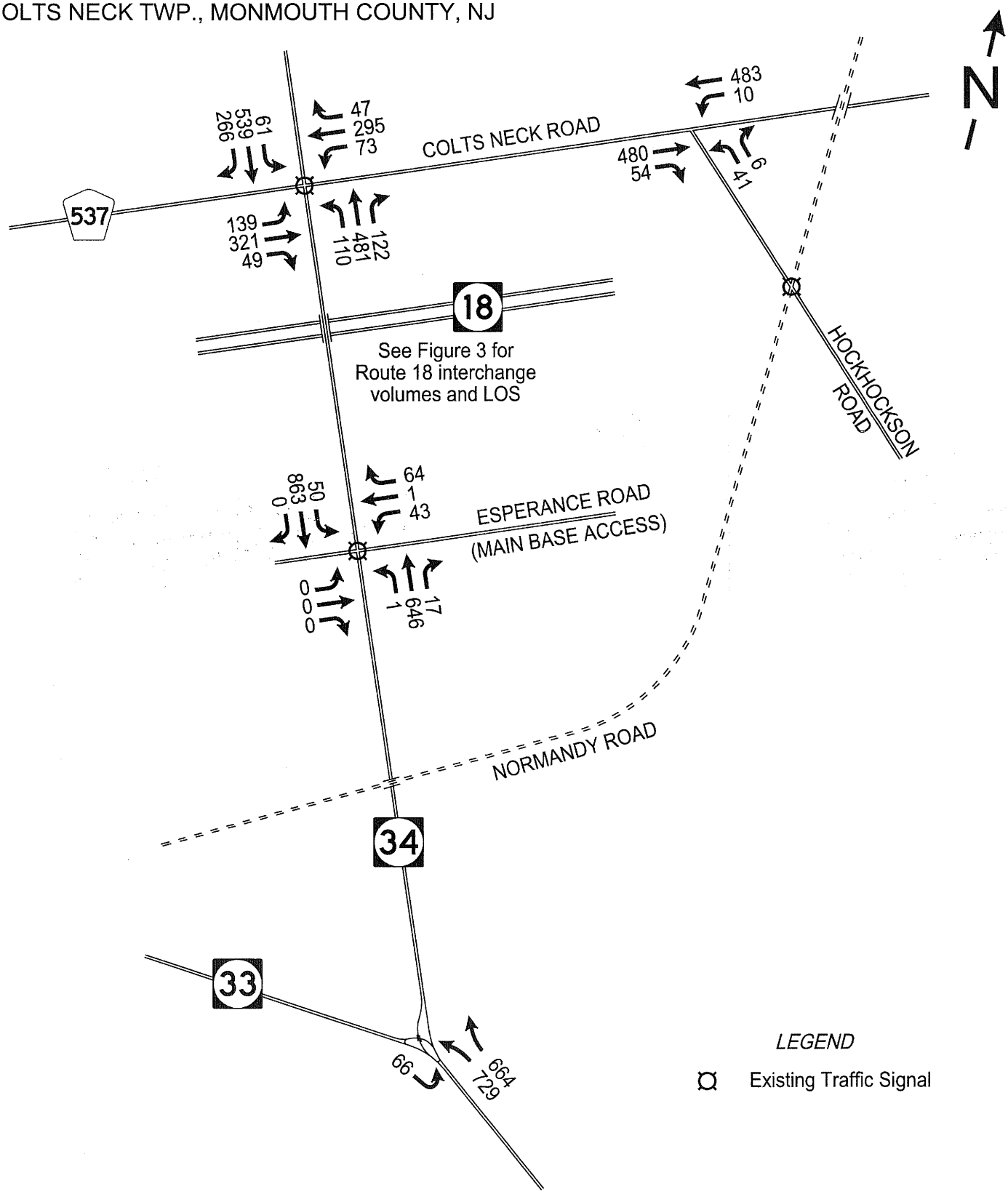


Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 2

Existing Weekday Evening Peak Hour Traffic Volumes
November, 2007

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

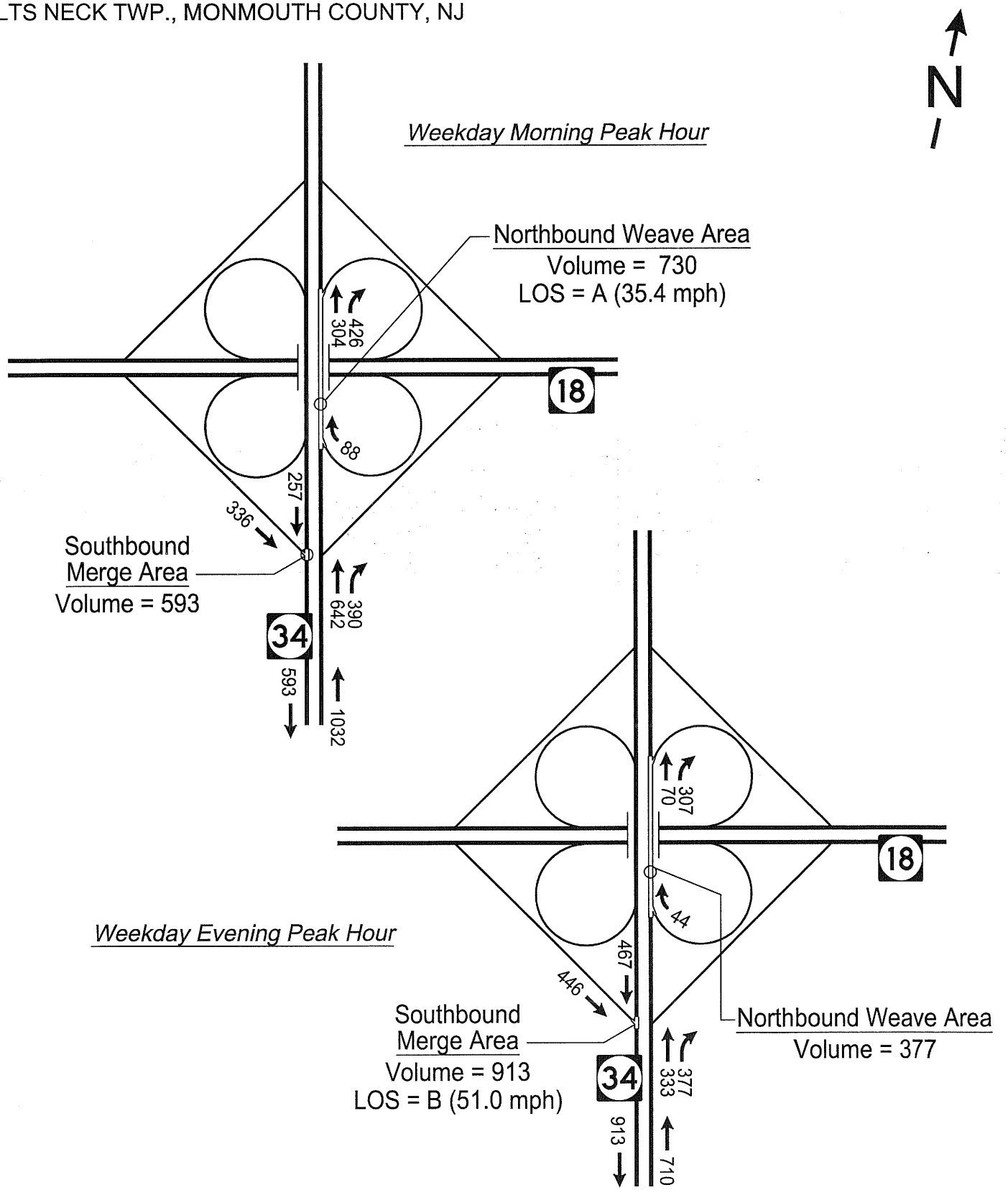


Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 3

Existing Weekday Peak Hour Traffic Volumes and Levels of Service Route 34 and Route 18 Interchange

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

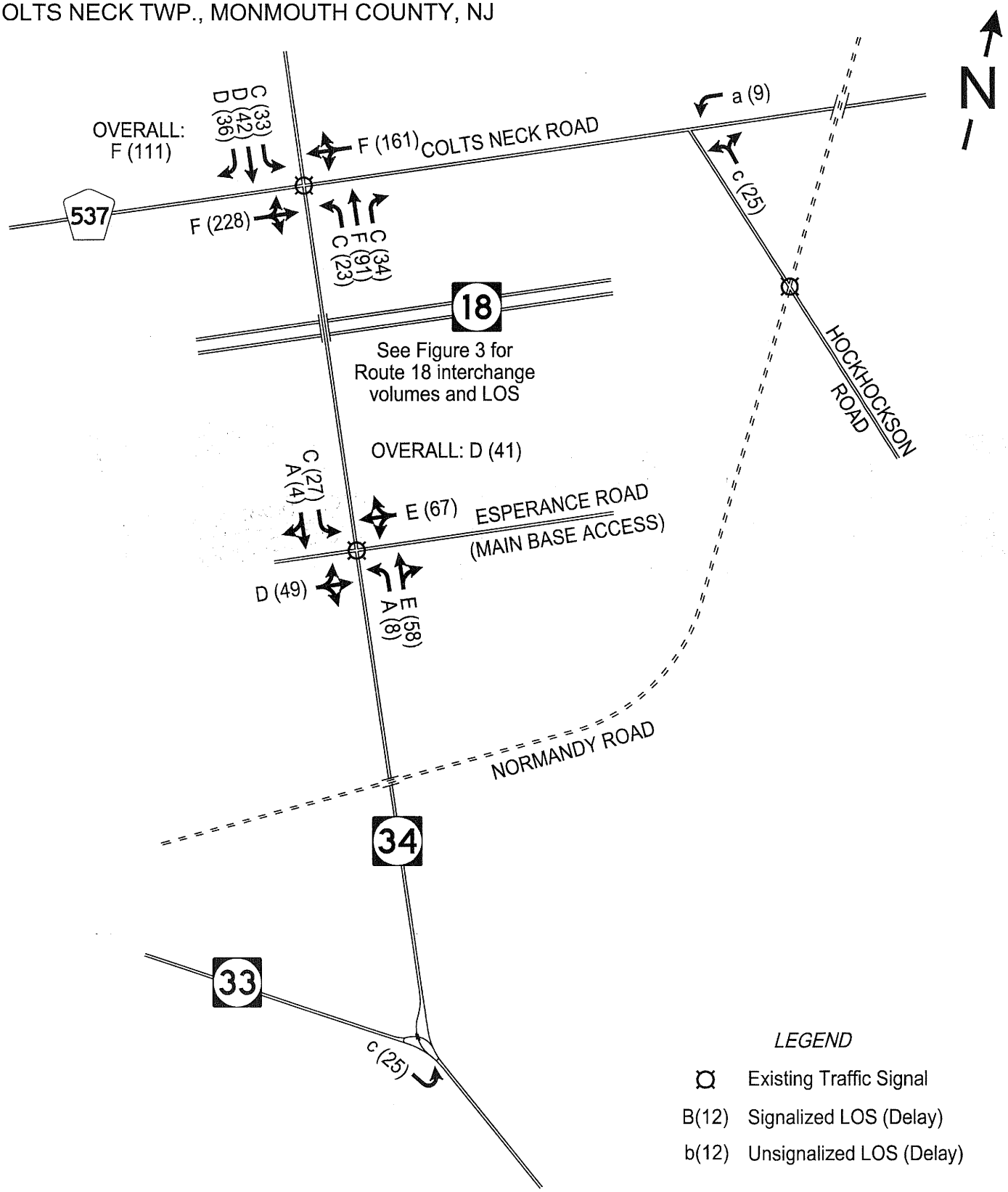


OR&A
Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 4

Existing Weekday Morning Peak Hour Levels of Service
November, 2007

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

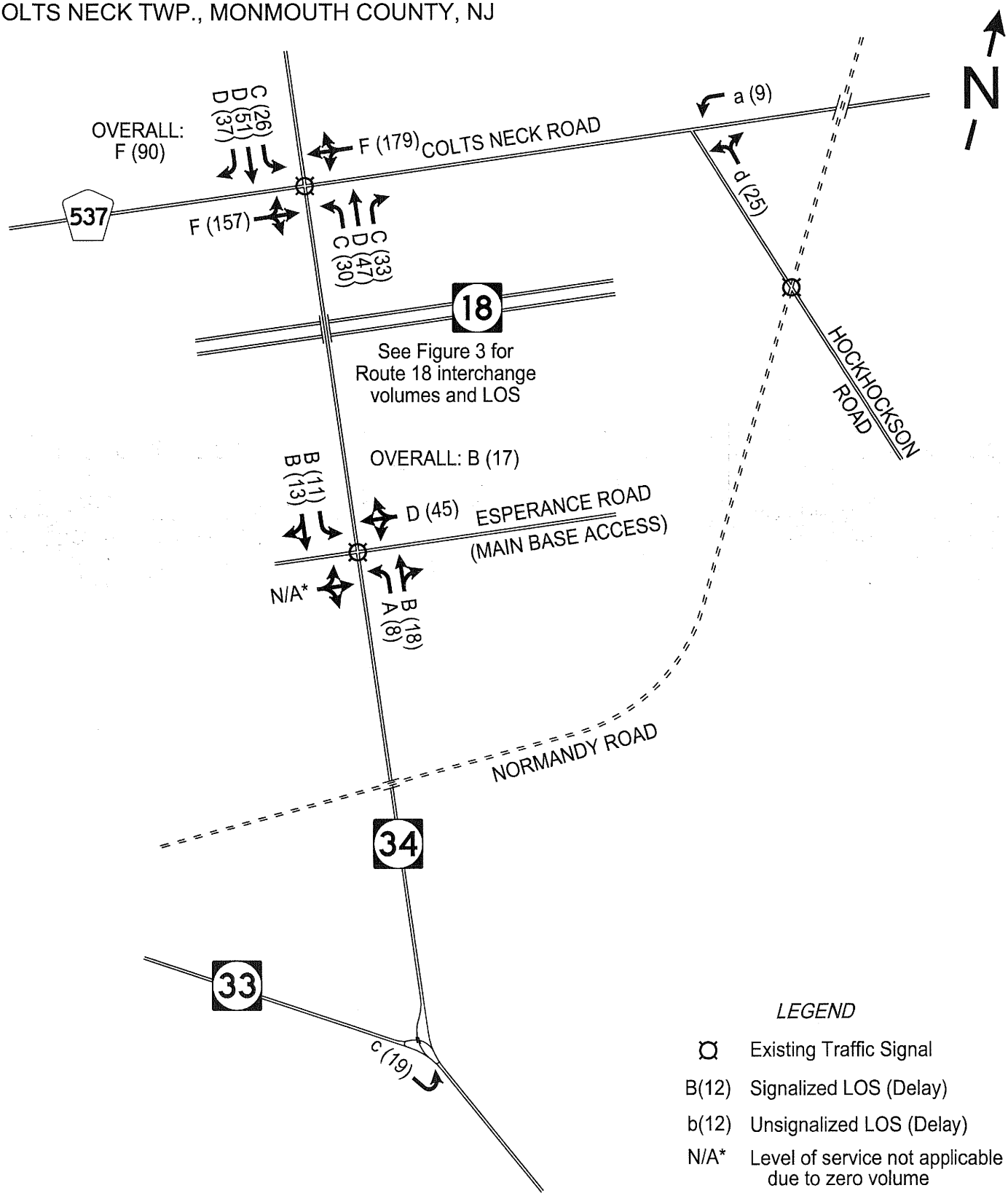


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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 5

Existing Weekday Evening Peak Hour Levels of Service
November, 2007

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

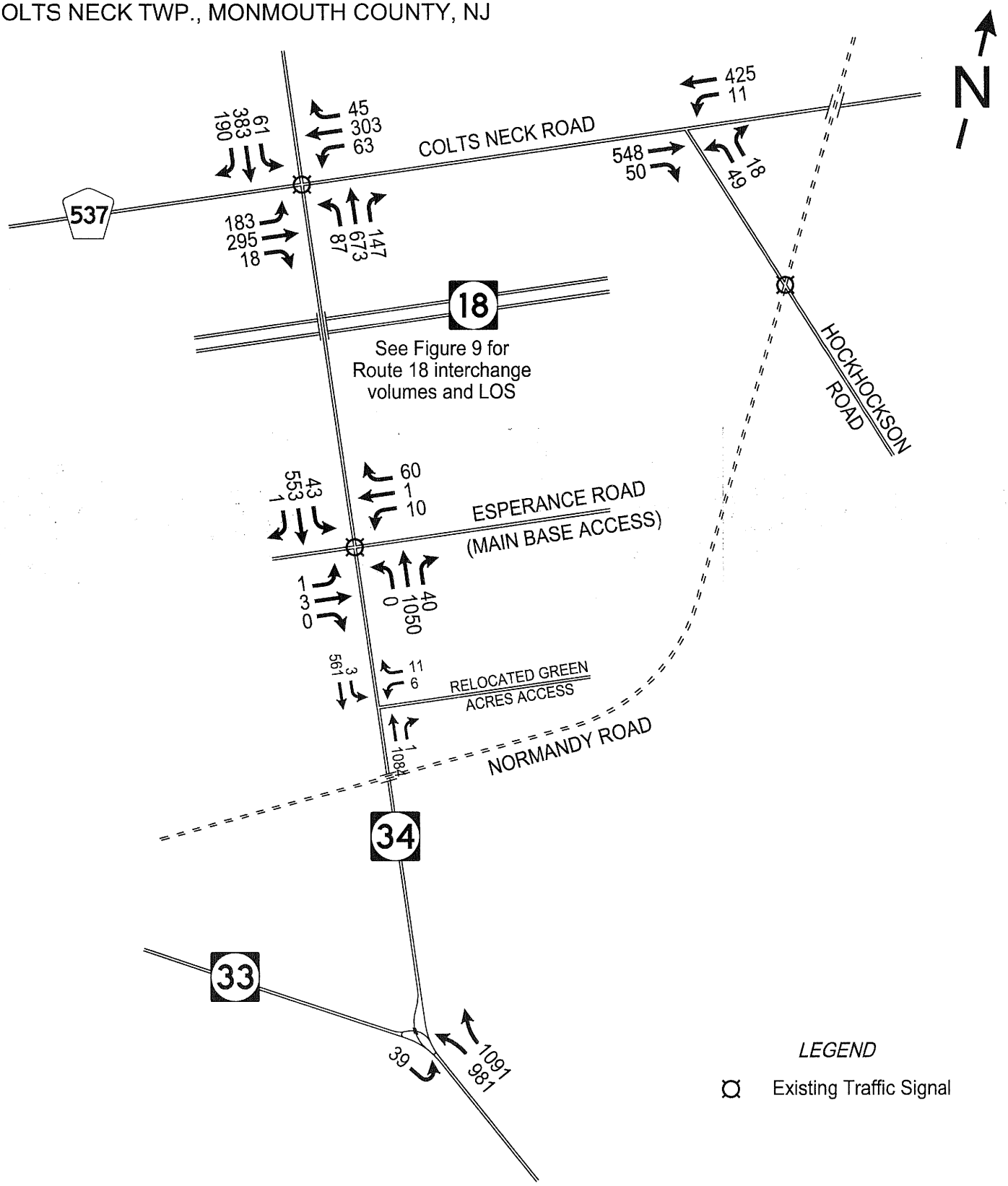


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FIGURE 6

Projected Future Year 2010 "No-Build" Weekday Morning Peak Hour Traffic Volumes

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

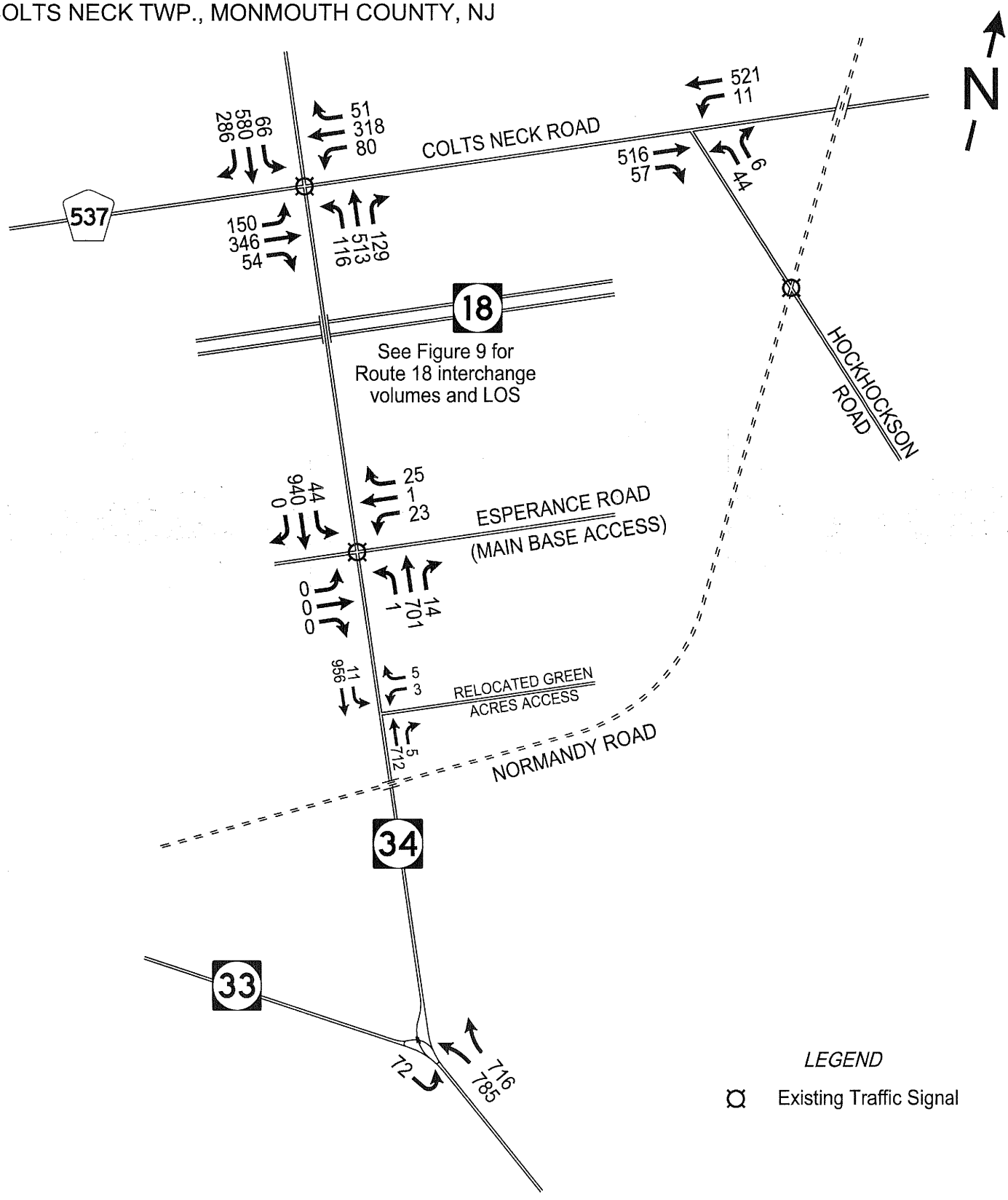


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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 7

Projected Future Year 2010 "No-Build" Weekday Evening Peak Hour Traffic Volumes

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 8

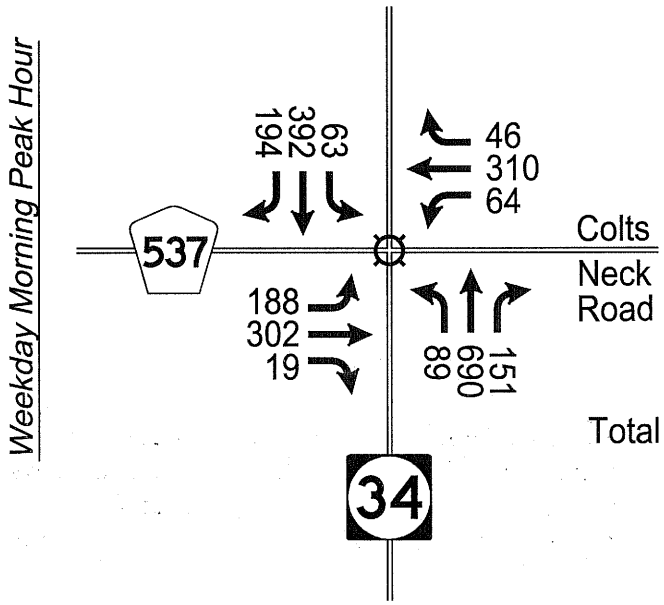
Projected Future Year 2011 "No-Build" Peak Hour Traffic Volumes Route 34 and Colts Neck Road (C.R. 537) Assuming NJDOT Improvements

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

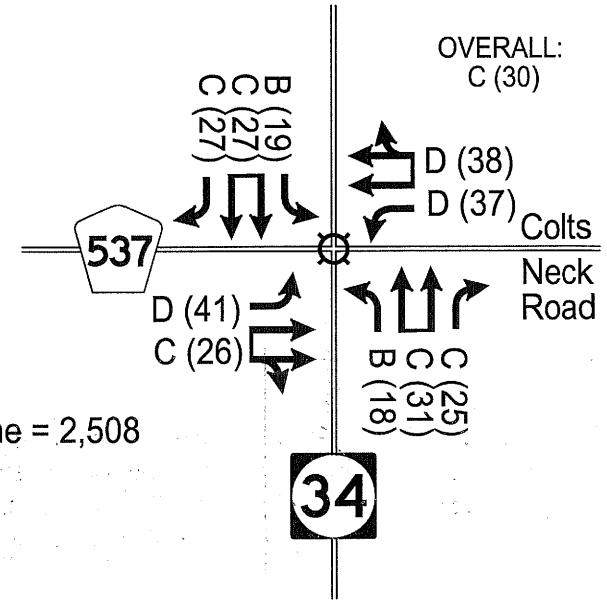
N

Peak Hour Traffic Volumes | *Peak Hour Levels of Service*

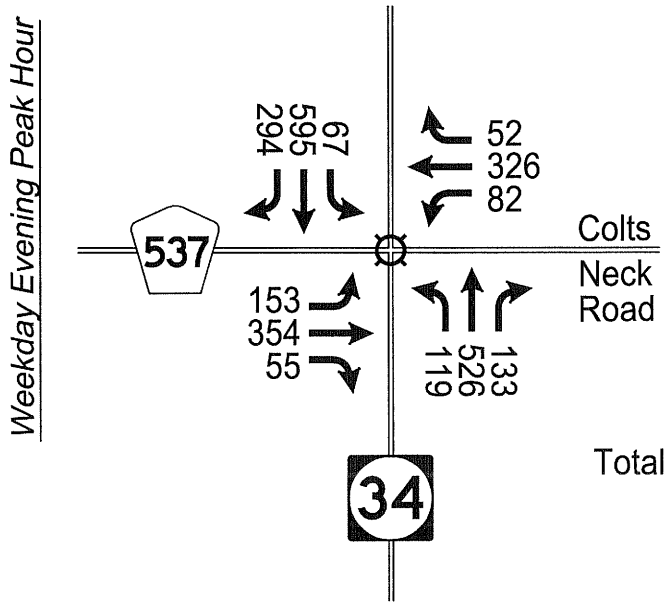
Weekday Morning Peak Hour



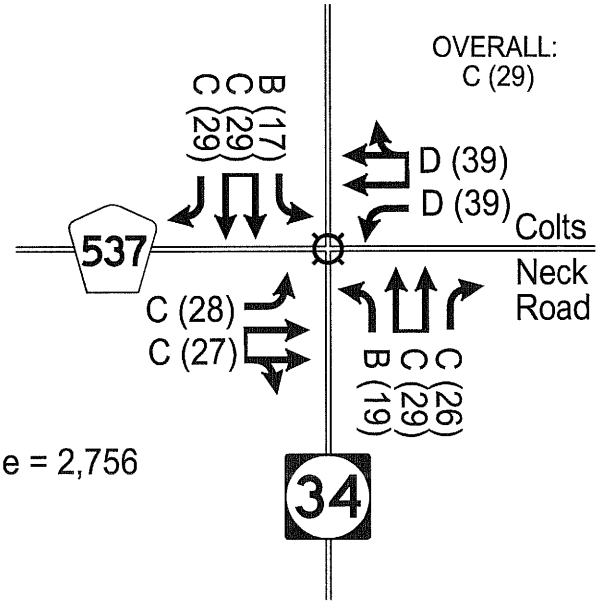
Total volume = 2,508



Weekday Evening Peak Hour



Total volume = 2,756



LEGEND

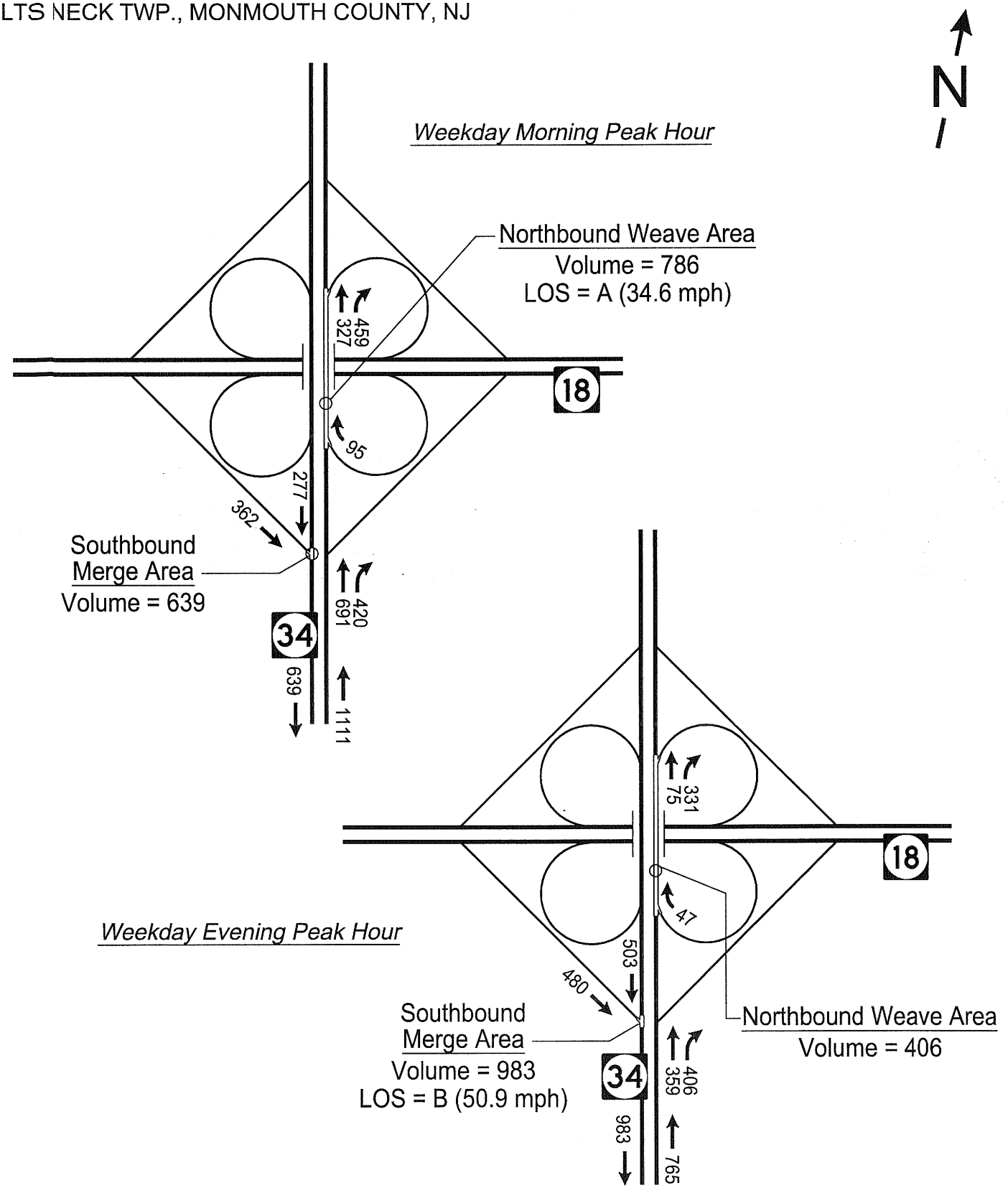
☼ Existing Traffic Signal B(12) Signalized LOS (Delay)

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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 9

No-Build Weekday Peak Hour Traffic Volumes and Levels of Service
Route 34 and Route 18 Interchange

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

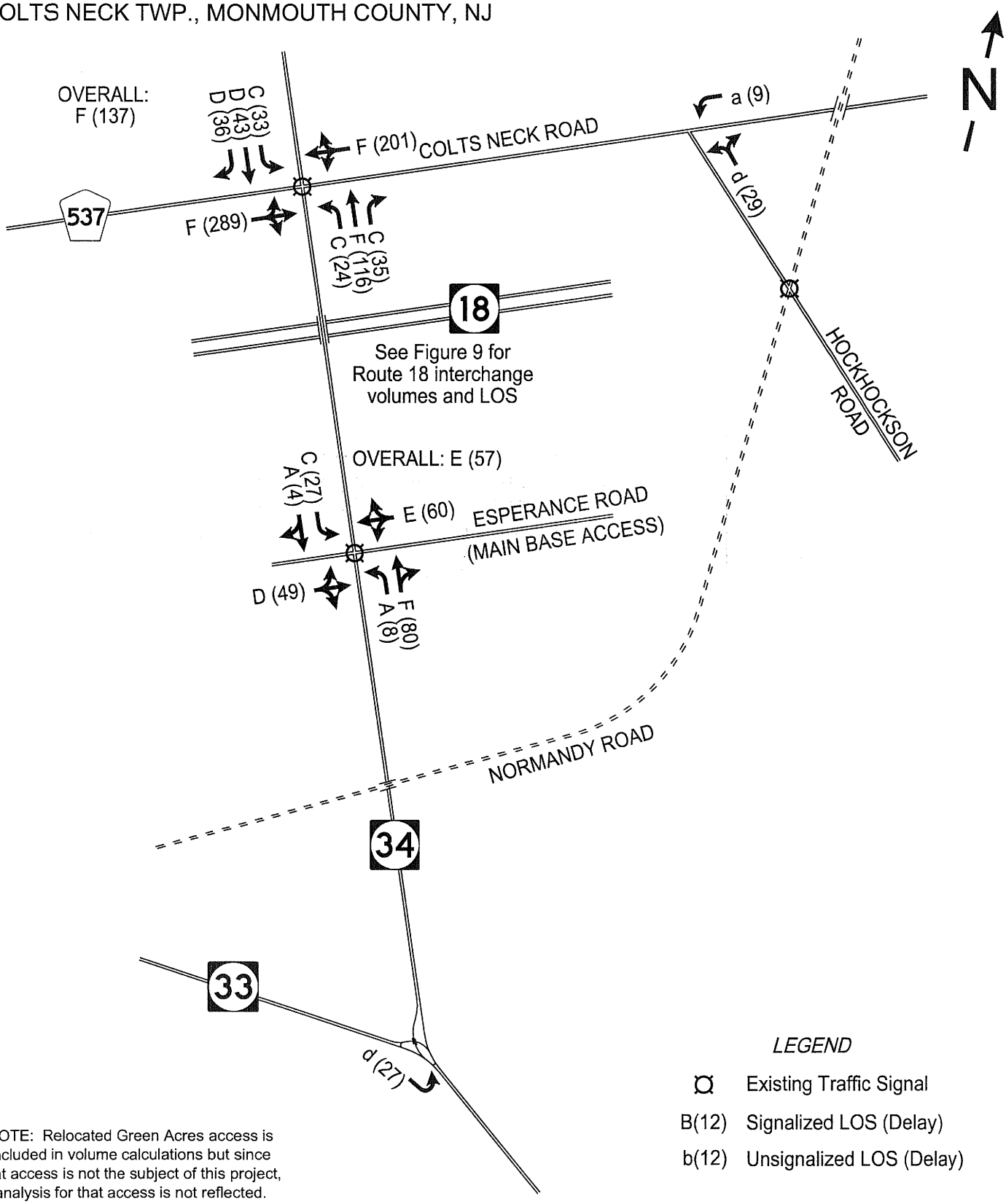


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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 10

Projected Future Year 2010 "No-Build" Weekday Morning Peak Hour Levels of Service

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



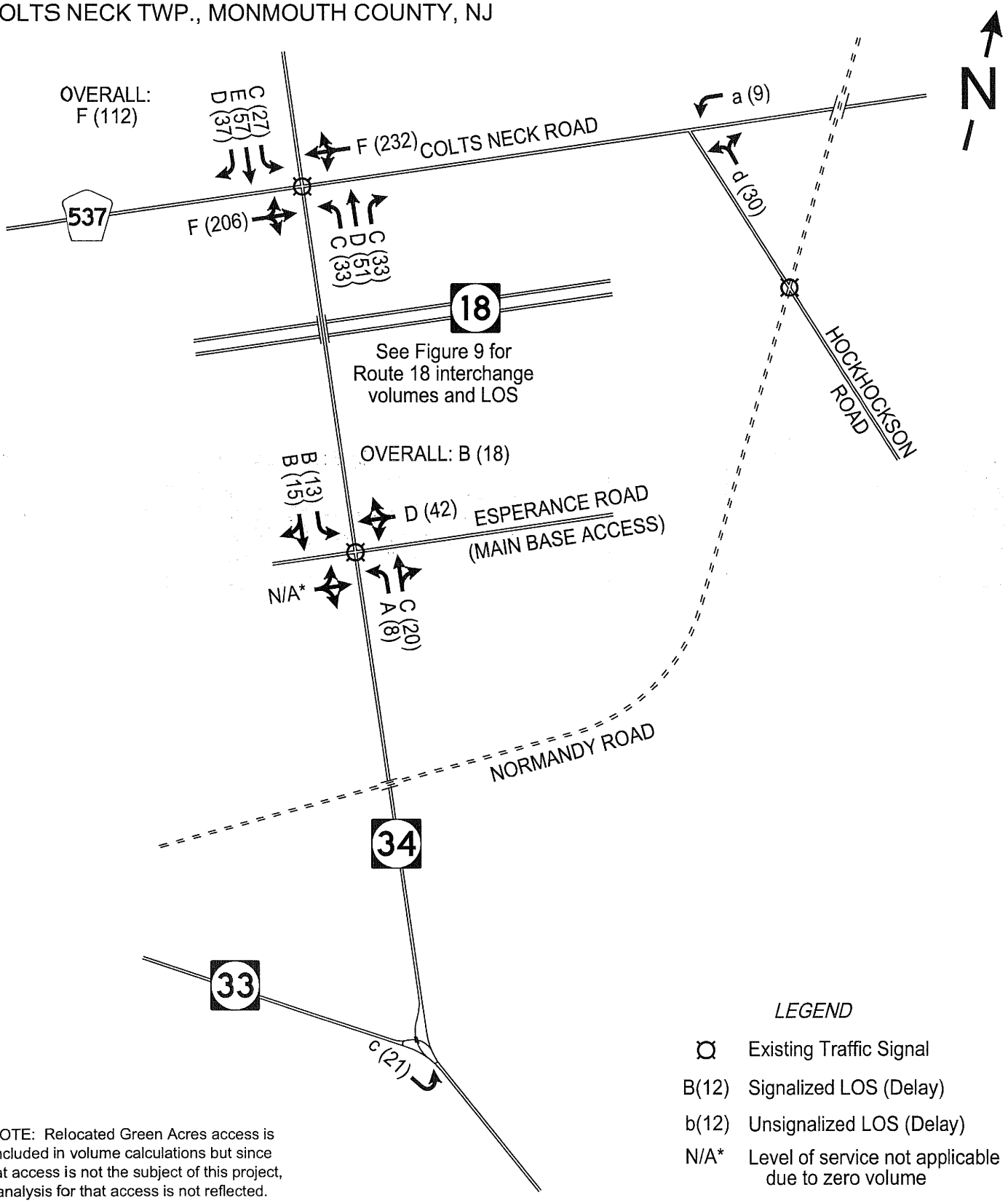
NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

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FIGURE 11

Projected Future Year 2010 "No-Build" Weekday Evening Peak Hour Levels of Service

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



LEGEND

☼	Existing Traffic Signal
B(12)	Signalized LOS (Delay)
b(12)	Unsignalized LOS (Delay)
N/A*	Level of service not applicable due to zero volume

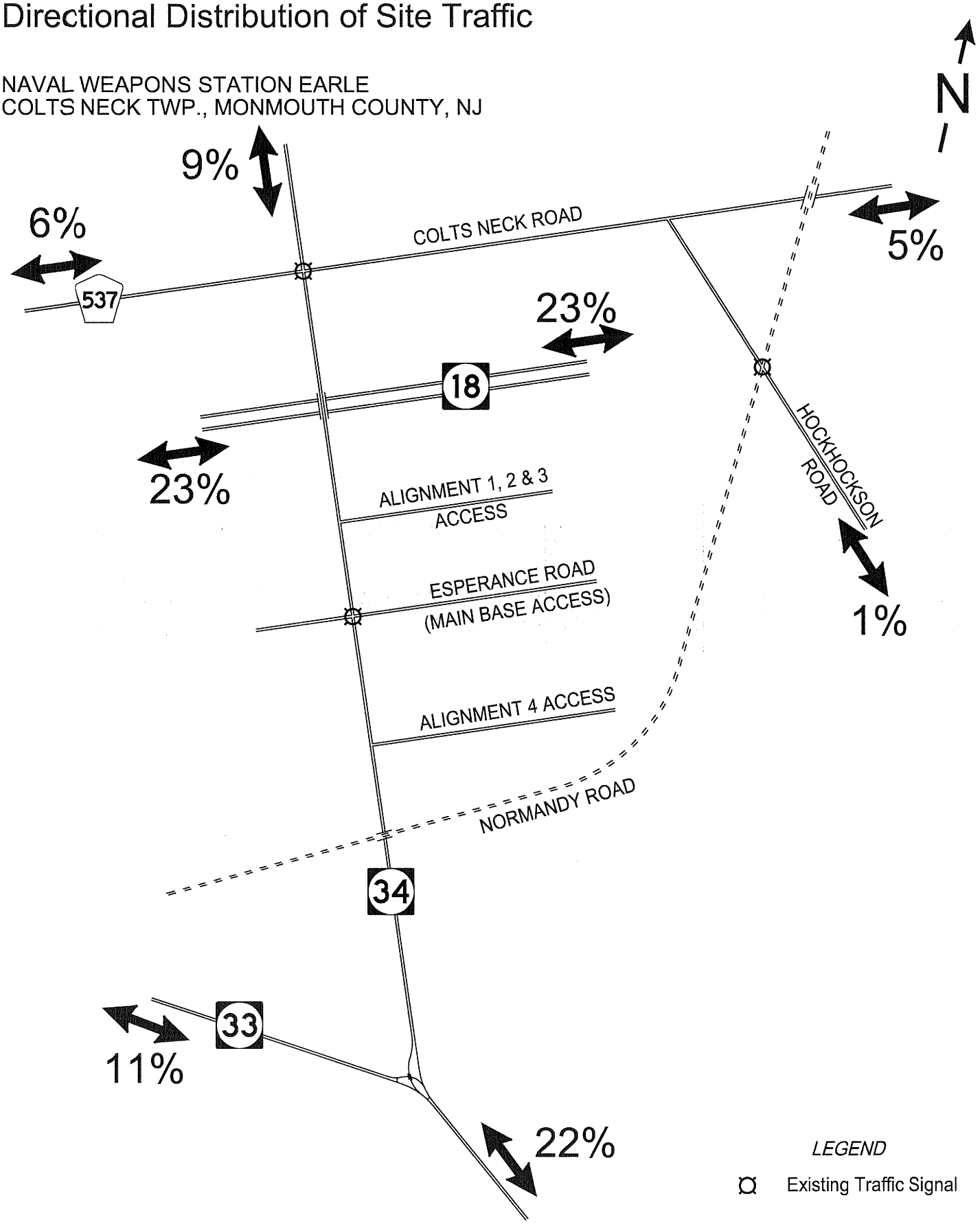
NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 12

Directional Distribution of Site Traffic

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

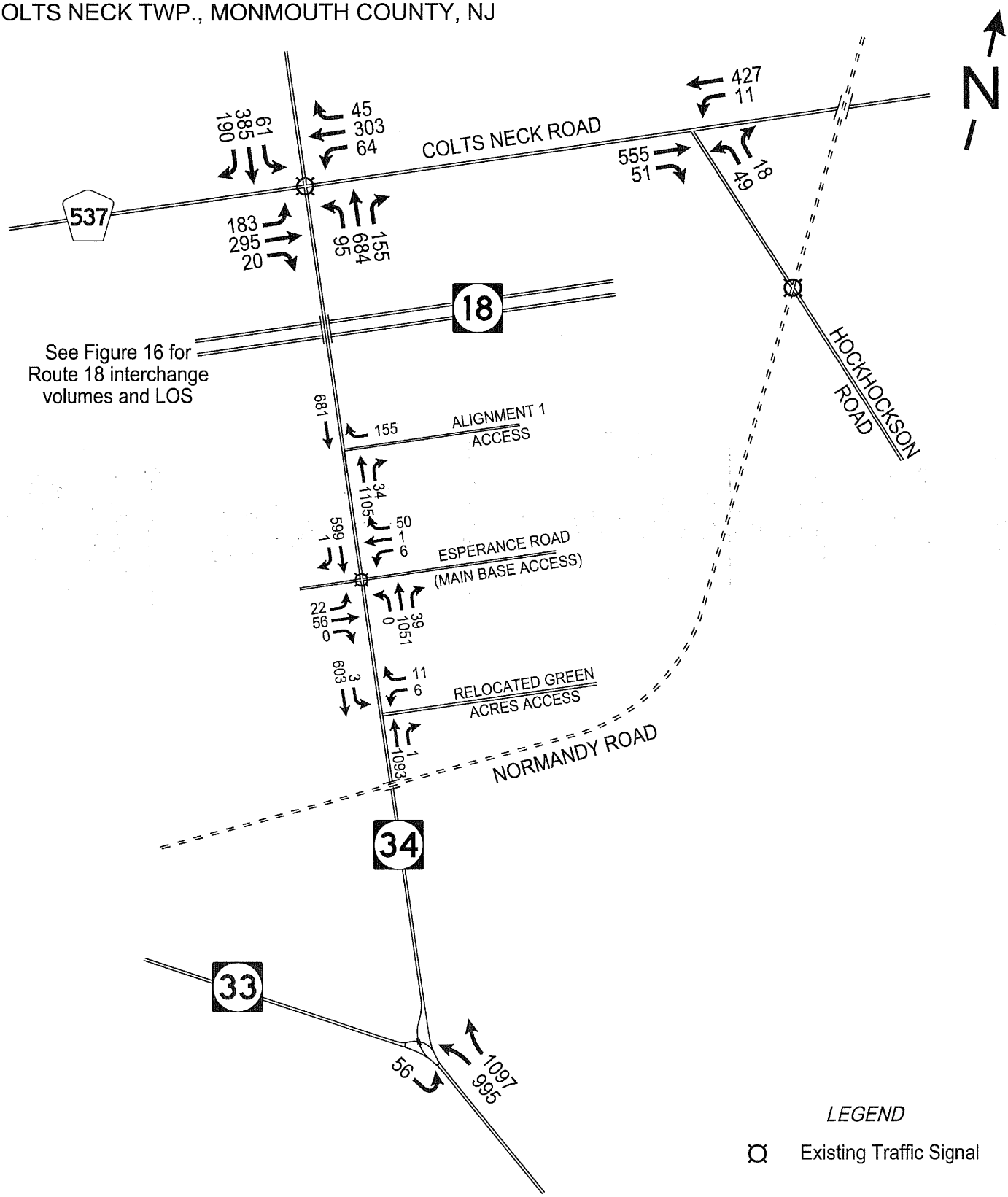


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FIGURE 13

Projected Future Year 2010 Full-Build Weekday Morning Peak Hour Traffic Volumes - ALIGNMENT 1

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

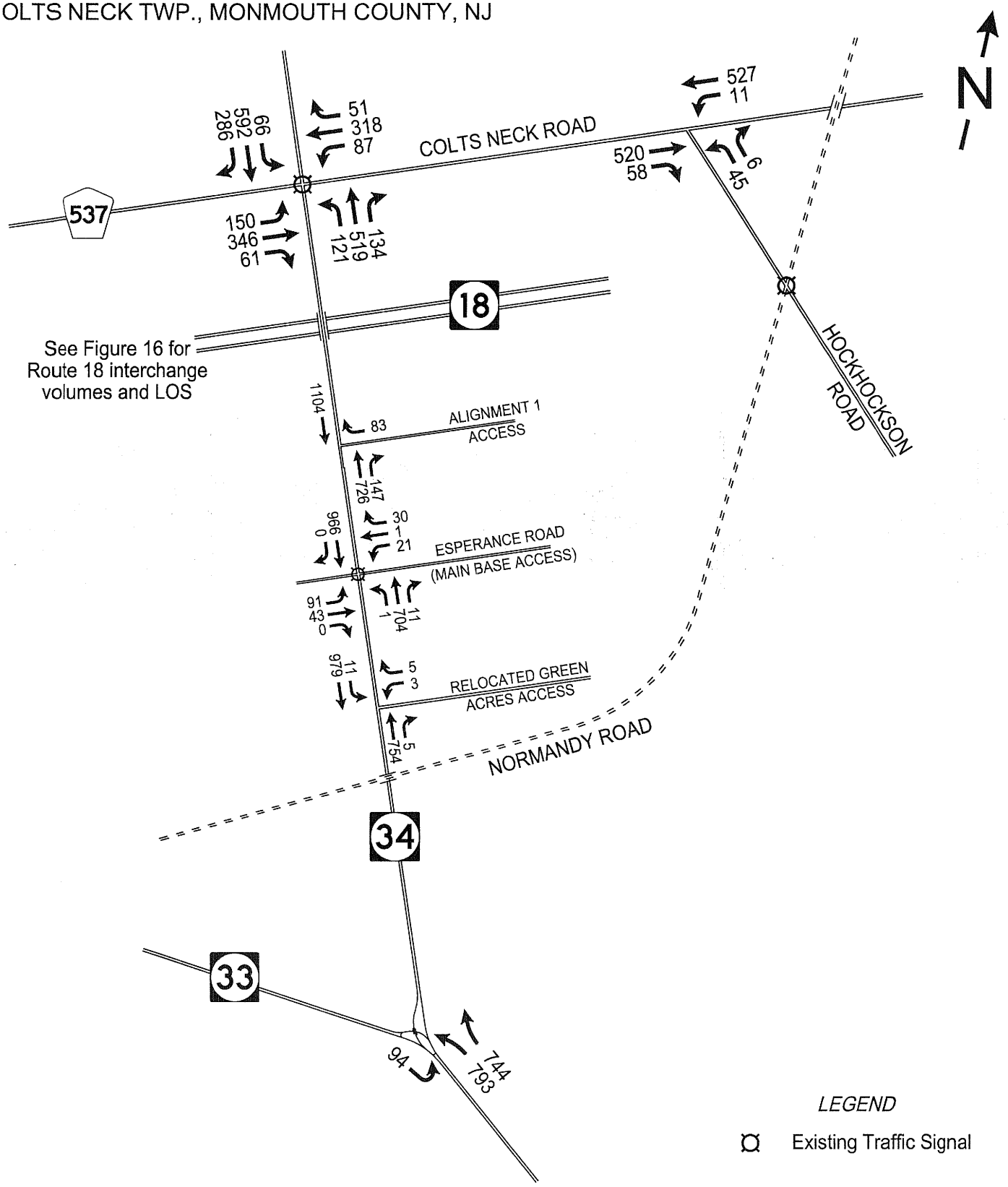


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FIGURE 14

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Traffic Volumes - ALIGNMENT 1

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



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FIGURE 15

Projected Future Year 2011 "Build" Peak Hour Traffic Volumes Under ALIGNMENT 1 - Route 34 and Colts Neck Road (C.R. 537) Assuming NJDOT Improvements

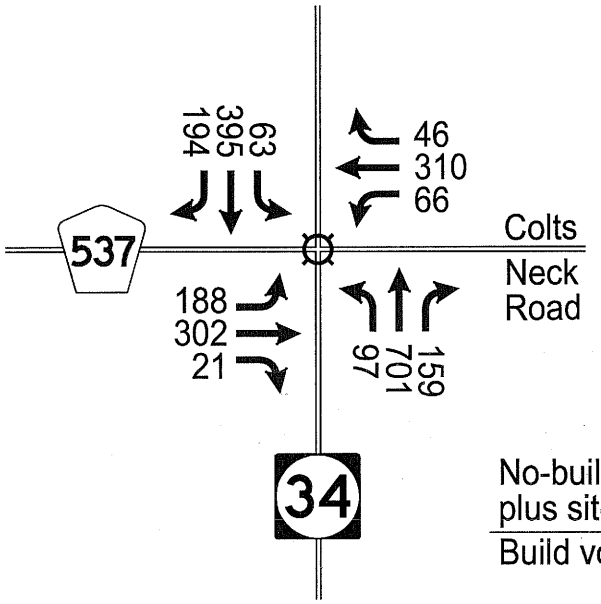
NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

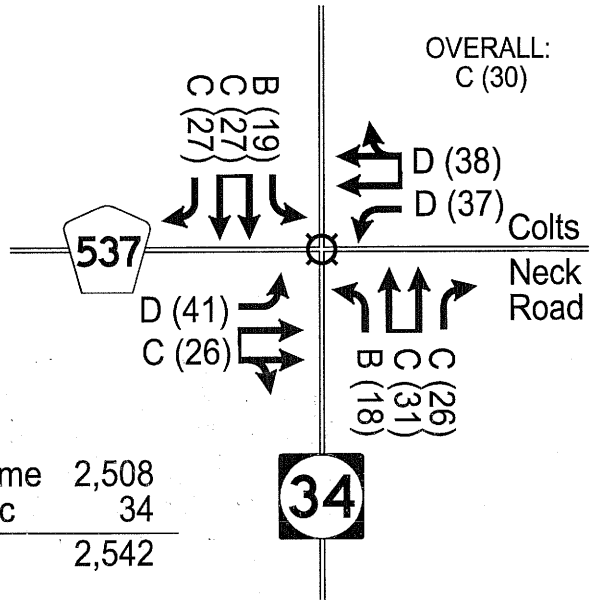
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Peak Hour Traffic Volumes

Peak Hour Levels of Service

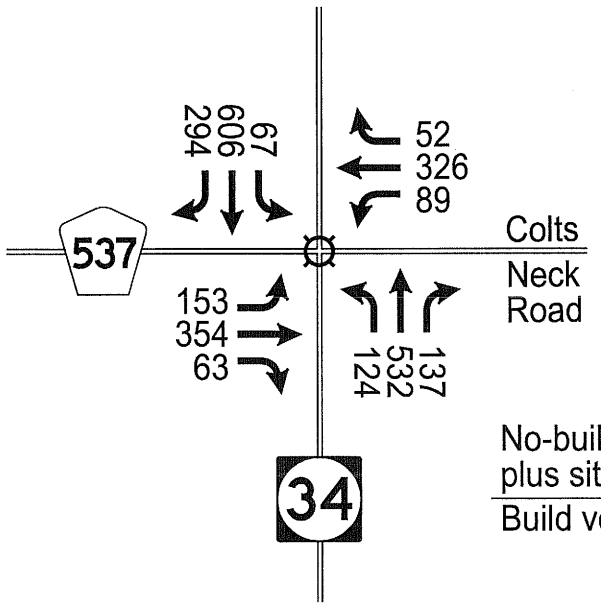
Weekday Morning Peak Hour

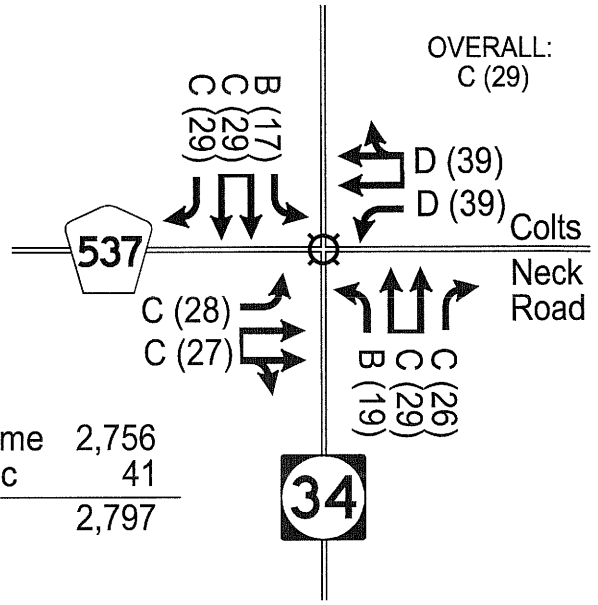




No-build volume	2,508
plus site traffic	34
Build volume	2,542

Weekday Evening Peak Hour





No-build volume	2,756
plus site traffic	41
Build volume	2,797

LEGEND

Existing Traffic Signal

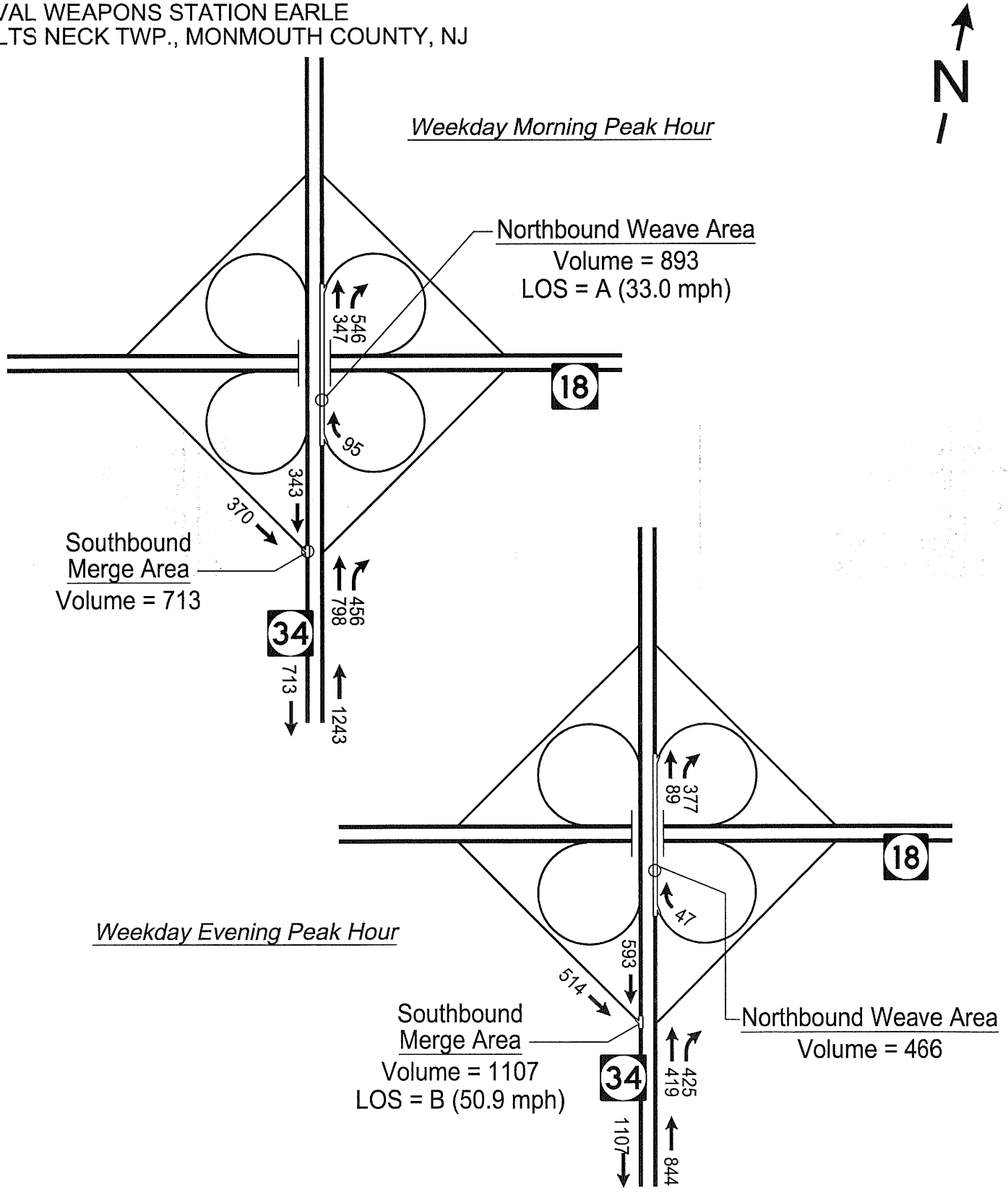
B(12) Signalized LOS (Delay)

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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 16

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Traffic Volumes - ALIGNMENT 1 Route 34 and Route 18 Interchange

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

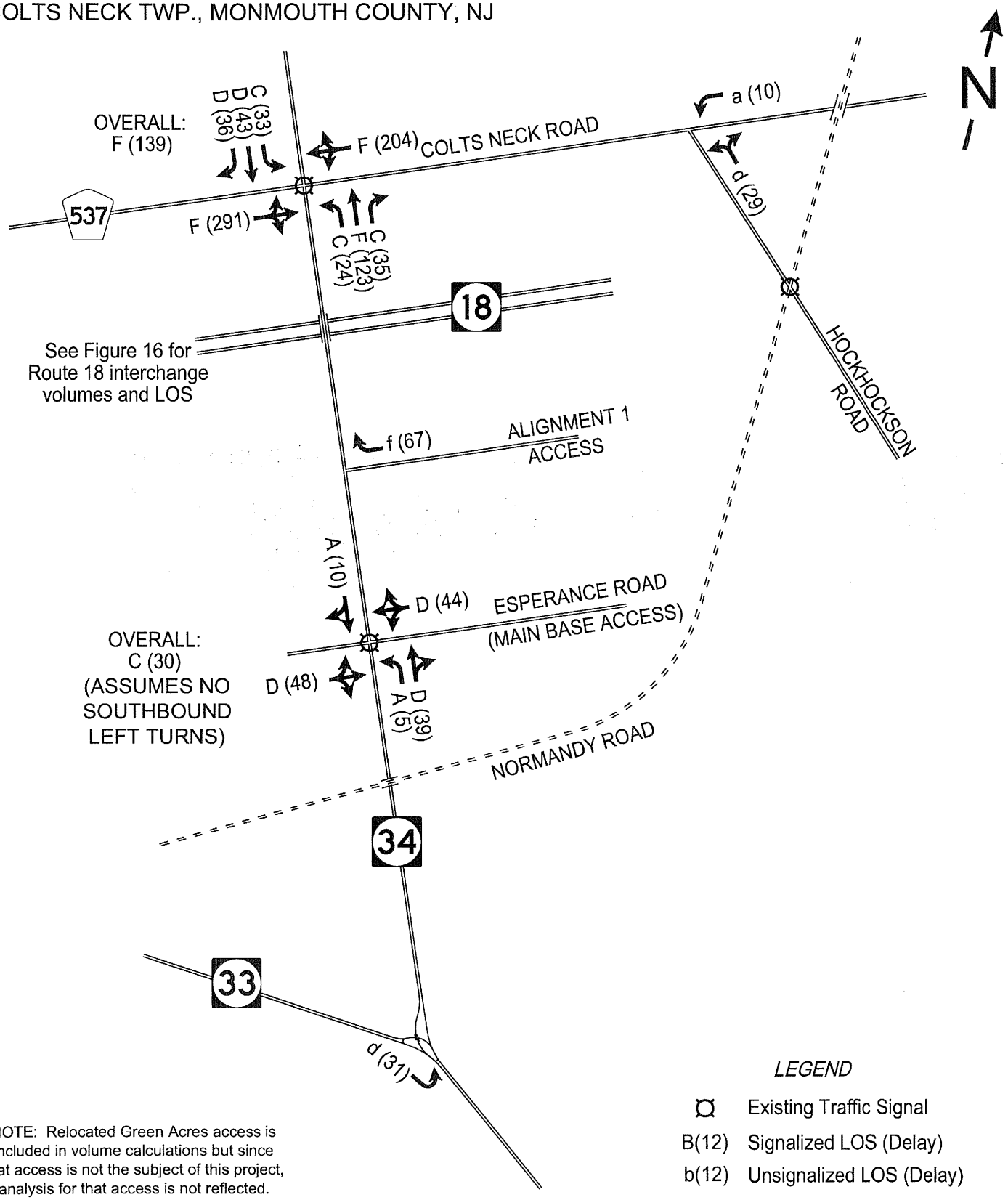


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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 17

Projected Future Year 2010 Full-Build Weekday Morning Peak Hour Levels of Service - ALIGNMENT 1

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

LEGEND

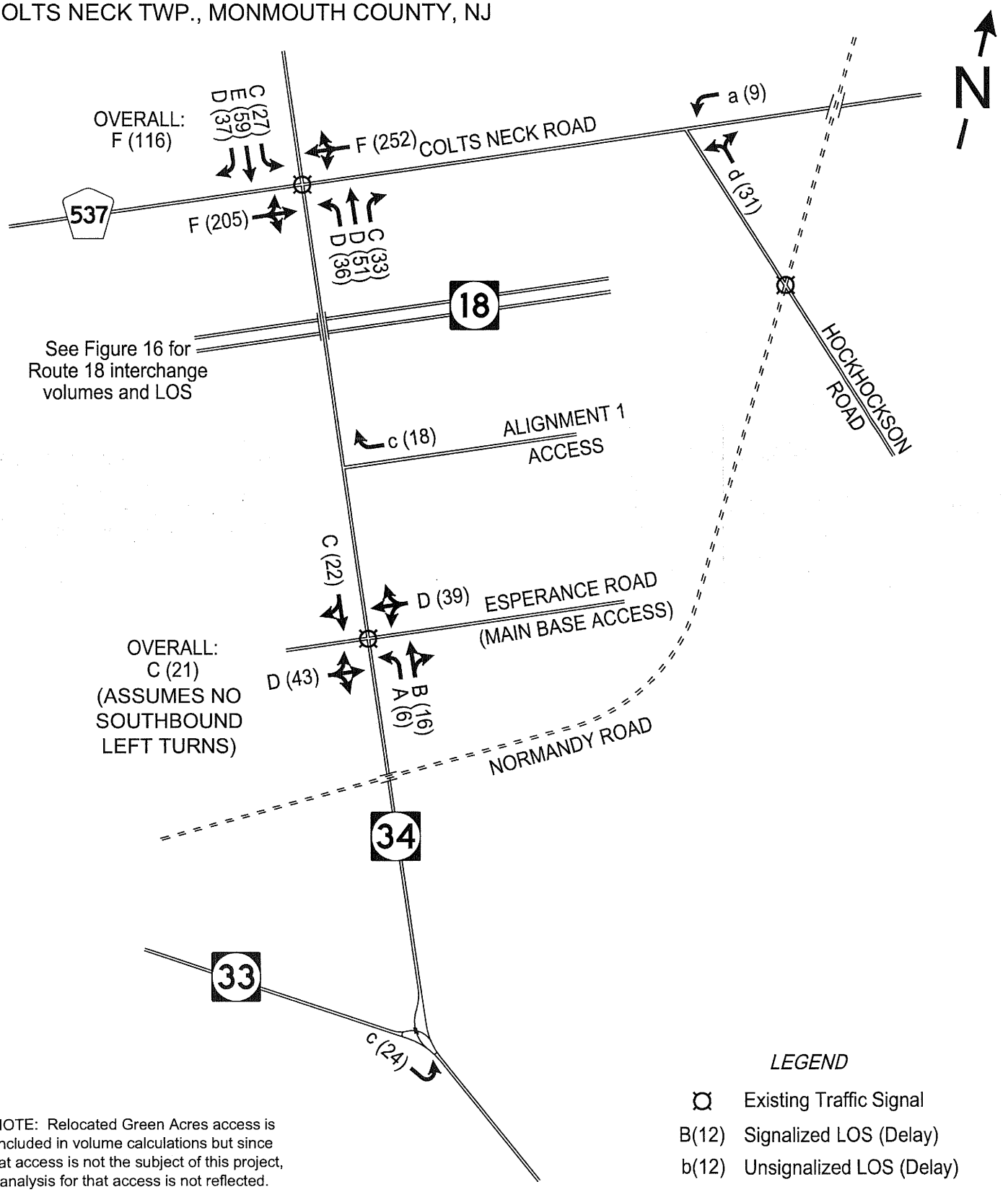
- Existing Traffic Signal
- B(12) Signalized LOS (Delay)
- b(12) Unsignalized LOS (Delay)

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TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 18

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Levels of Service - ALIGNMENT 1

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

LEGEND

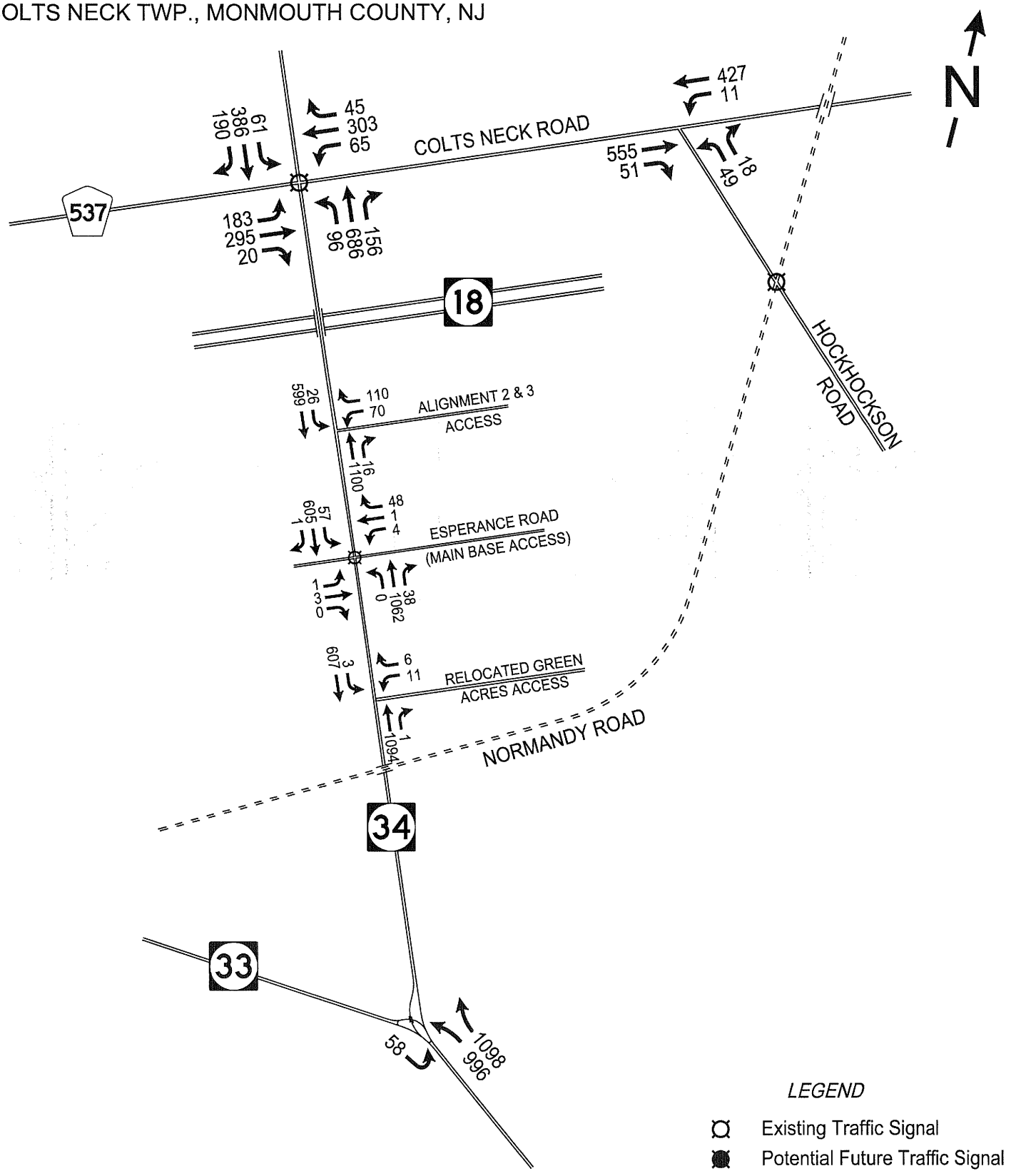
- Existing Traffic Signal
- B(12) Signalized LOS (Delay)
- b(12) Unsignalized LOS (Delay)

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 19

Projected Future Year 2010 Full-Build Weekday Morning Peak Hour Traffic Volumes - ALIGNMENTS 2 & 3

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

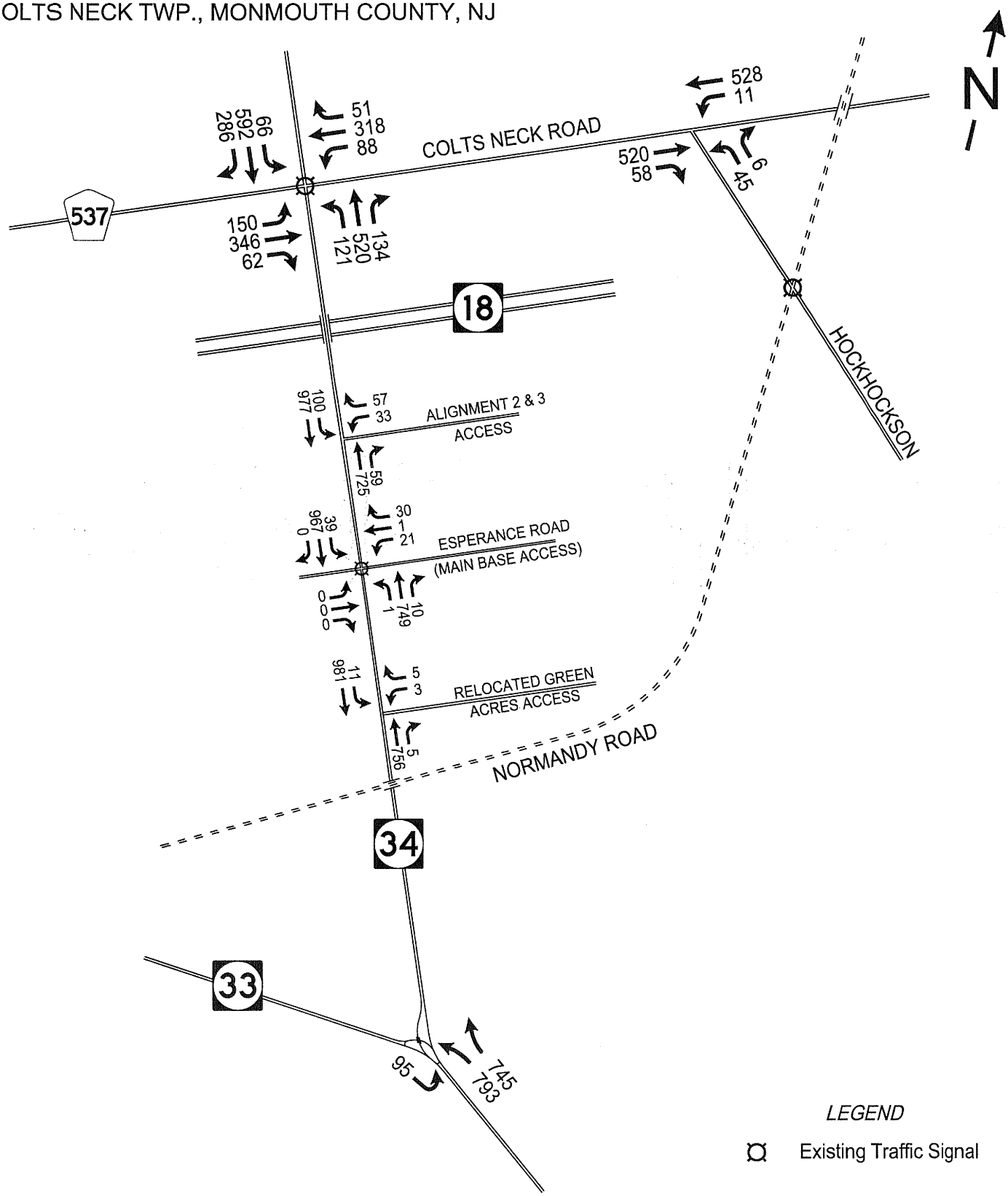


Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 20

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Traffic Volumes - ALIGNMENTS 2 & 3

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 21

Projected Future Year 2011 "Build" Peak Hour Traffic Volumes Under ALIGNMENTS 2 & 3 - Route 34 and Colts Neck Road (C.R. 537) Assuming NJDOT Improvements

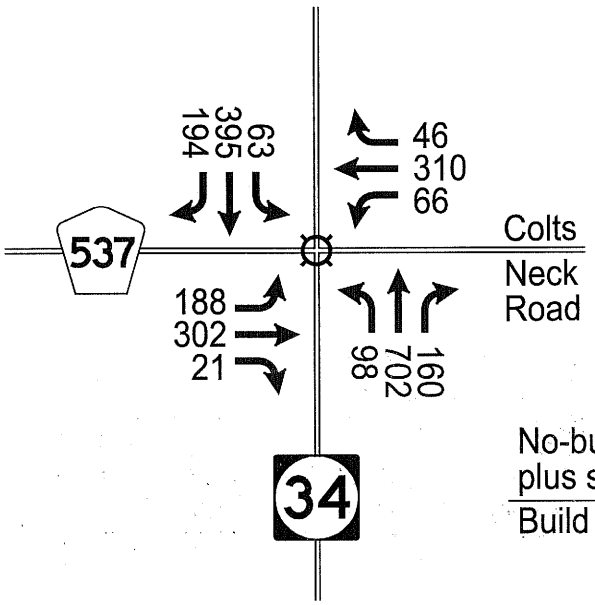
NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

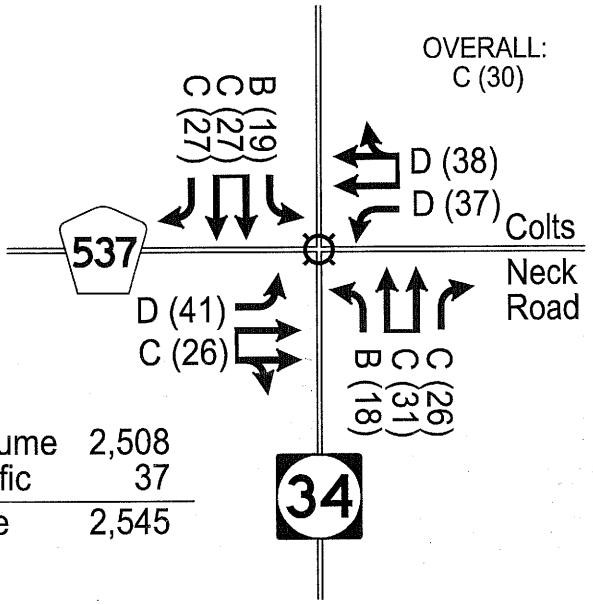
N

Peak Hour Traffic Volumes

Peak Hour Levels of Service

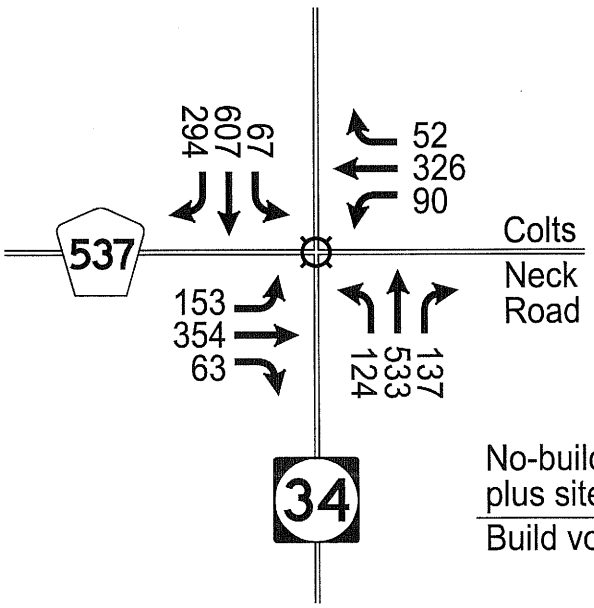
Weekday Morning Peak Hour

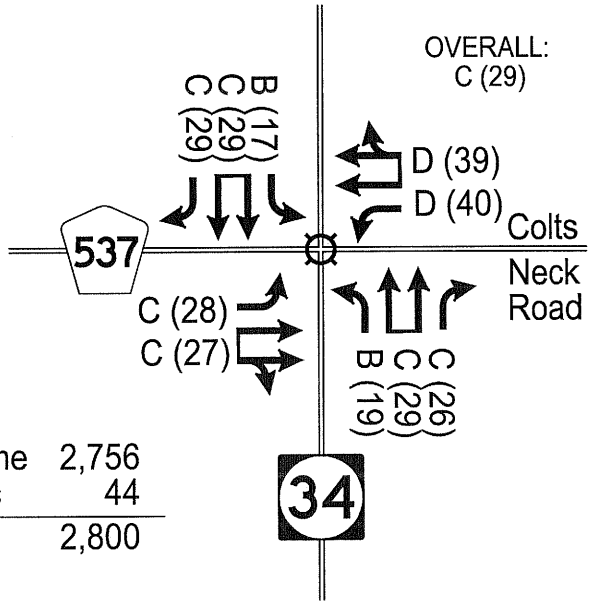




No-build volume	2,508
plus site traffic	37
Build volume	2,545

Weekday Evening Peak Hour





No-build volume	2,756
plus site traffic	44
Build volume	2,800

LEGEND

Existing Traffic Signal

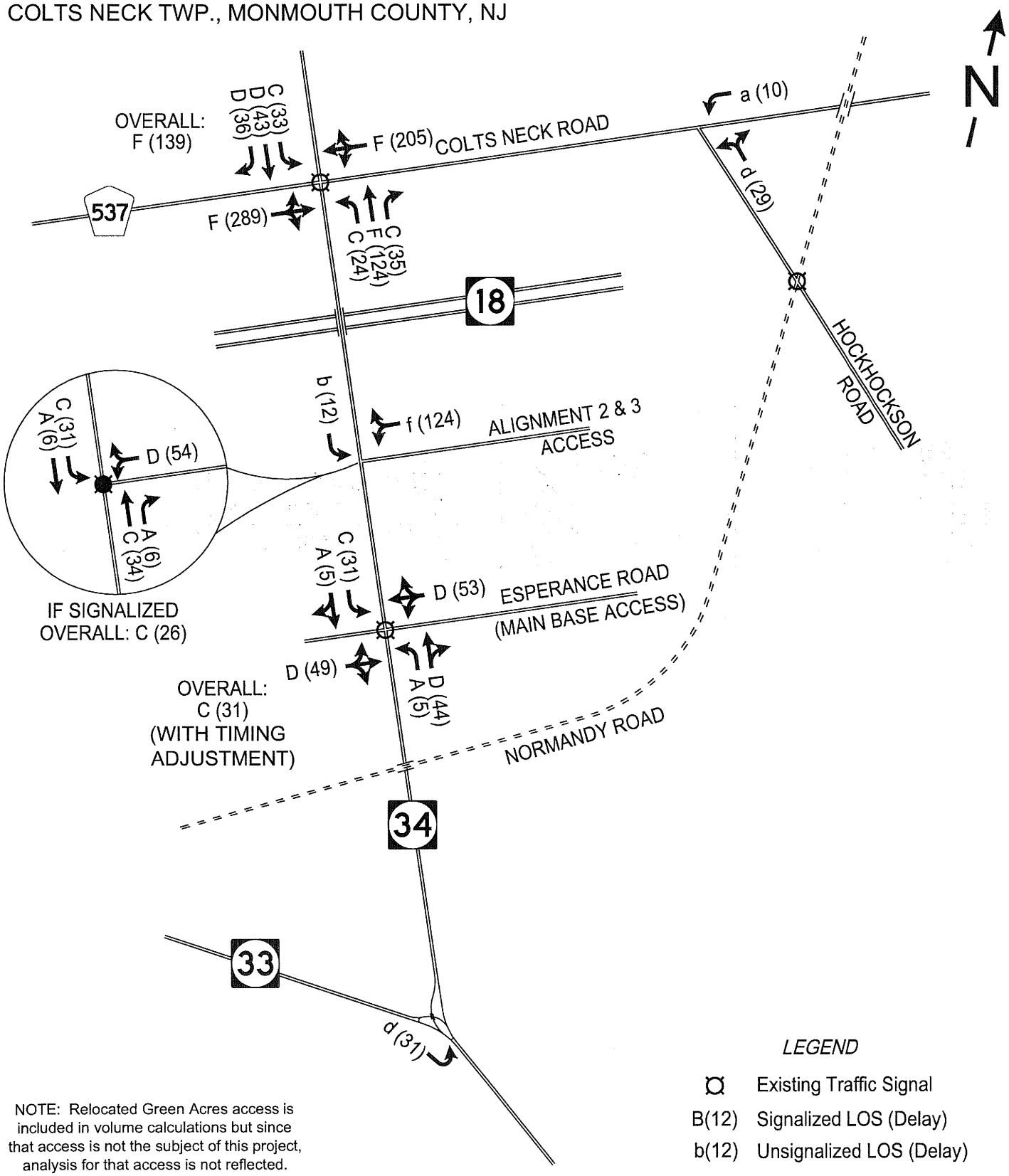
B(12) Signalized LOS (Delay)

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 22

Projected Future Year 2010 Full-Build Weekday Morning Peak Hour Levels of Service - ALIGNMENTS 2 & 3

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

LEGEND

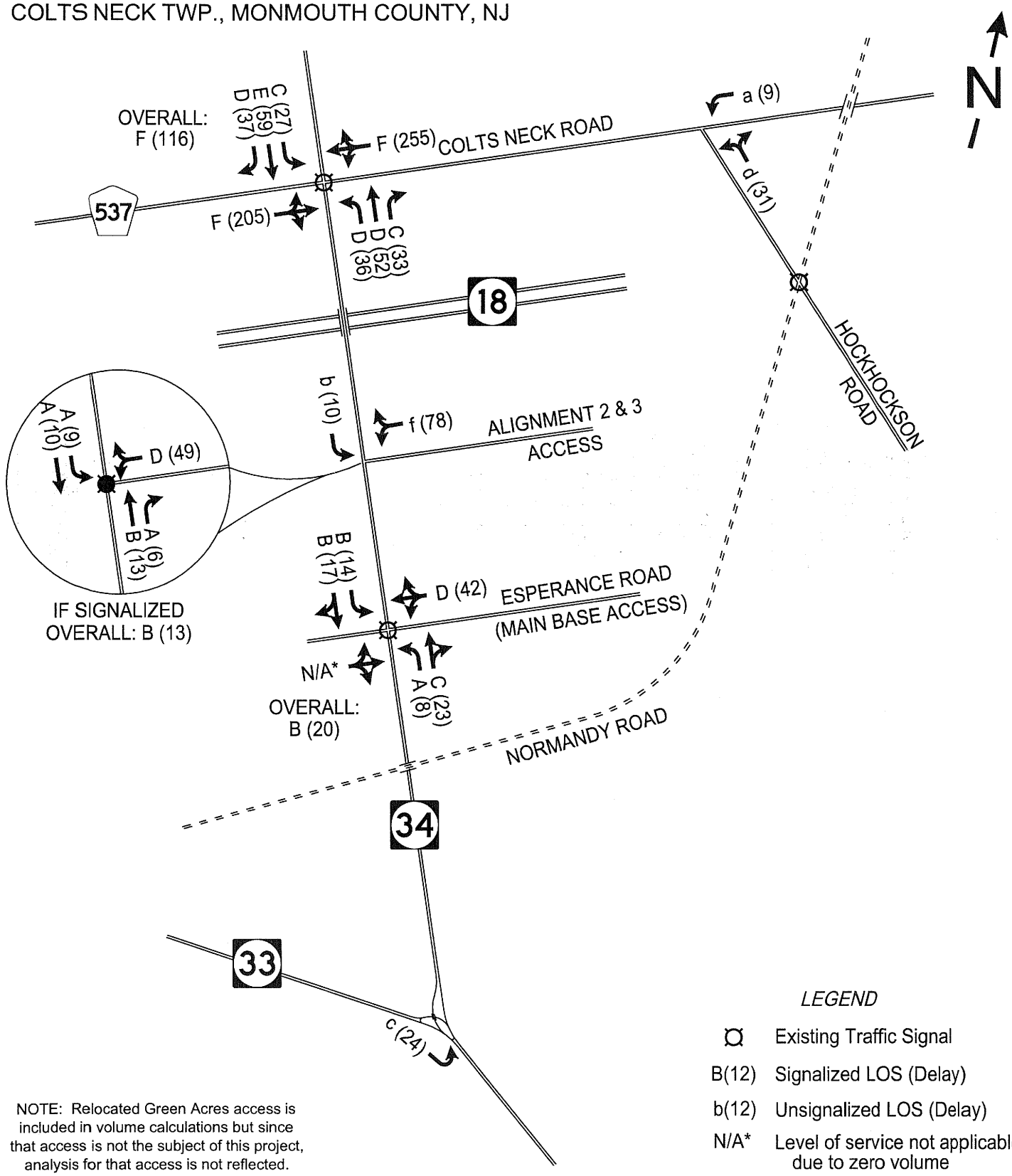
☼	Existing Traffic Signal
B(12)	Signalized LOS (Delay)
b(12)	Unsignalized LOS (Delay)

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 23

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Levels of Service - ALIGNMENTS 2 & 3

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



LEGEND

☼	Existing Traffic Signal
B(12)	Signalized LOS (Delay)
b(12)	Unsignalized LOS (Delay)
N/A*	Level of service not applicable due to zero volume

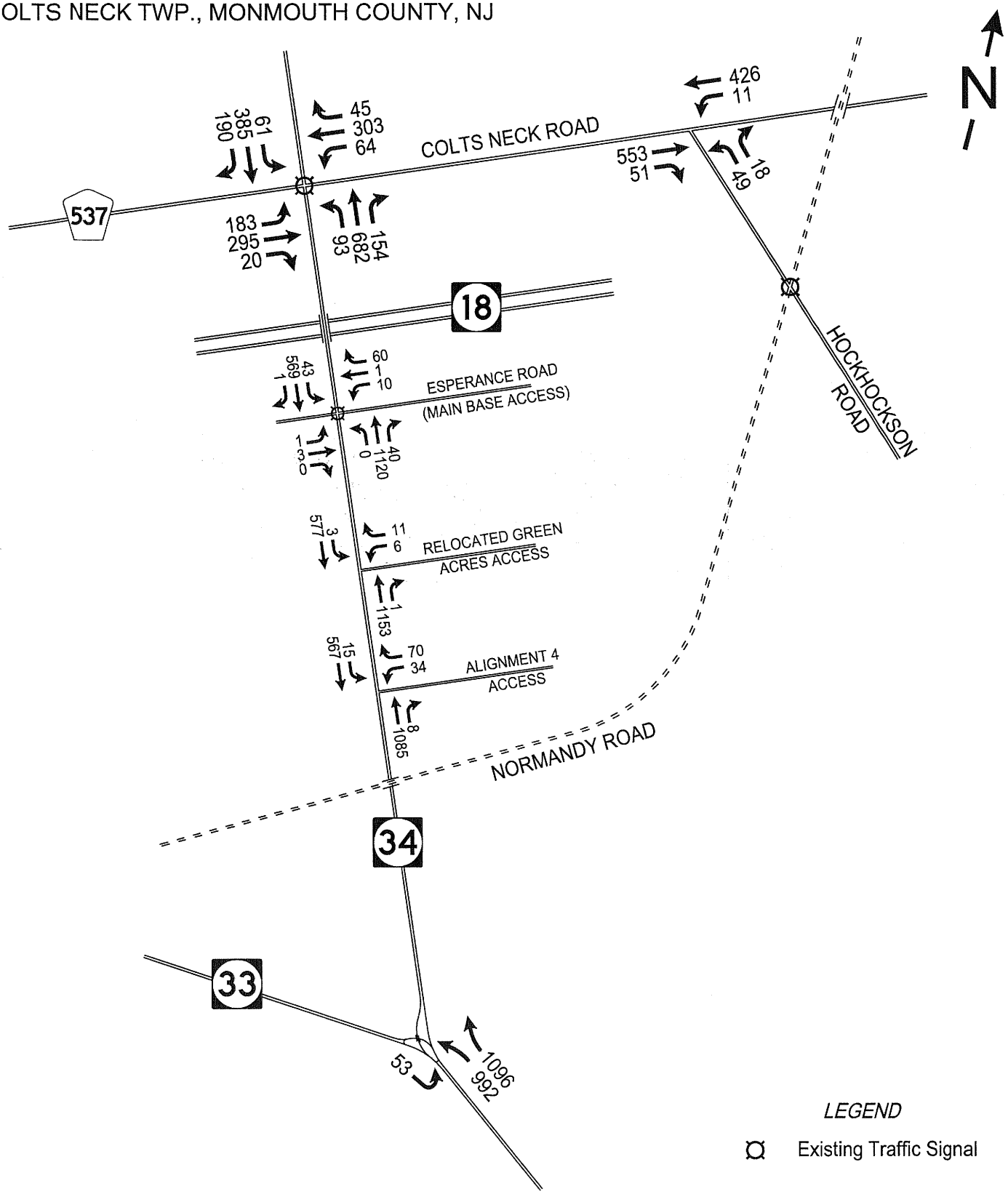
NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 24

Projected Future Year 2010 Full-Build Weekday Morning Peak Hour Traffic Volumes - ALIGNMENT 4

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

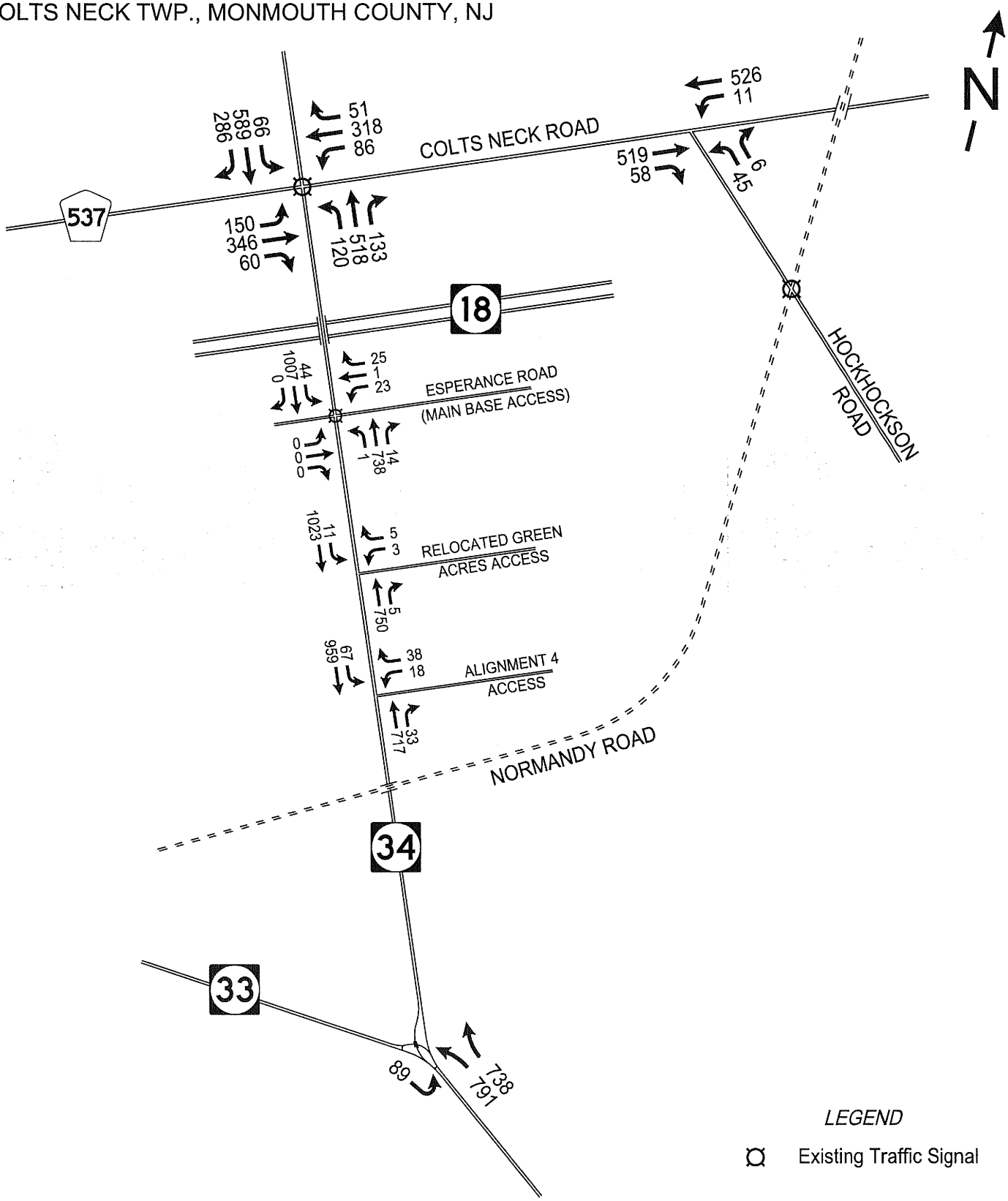


Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 25

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Traffic Volumes - ALIGNMENT 4

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 26

Projected Future Year 2011 "Build" Peak Hour Traffic Volumes Under ALIGNMENT 4 - Route 34 and Colts Neck Road (C.R. 537) Assuming NJDOT Improvements

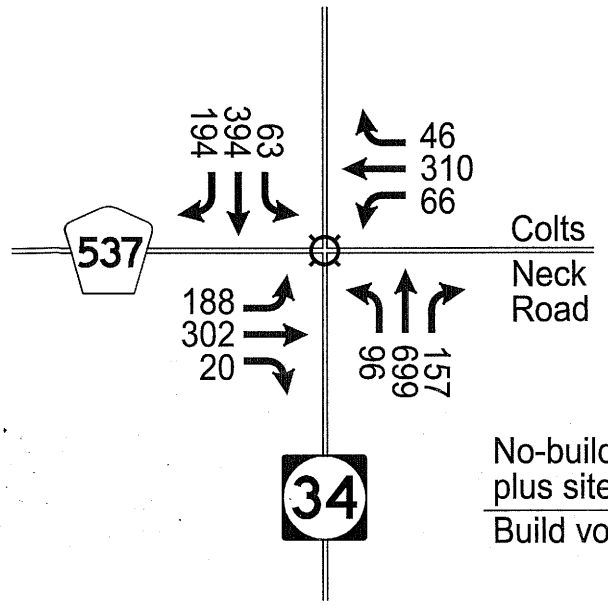
NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ

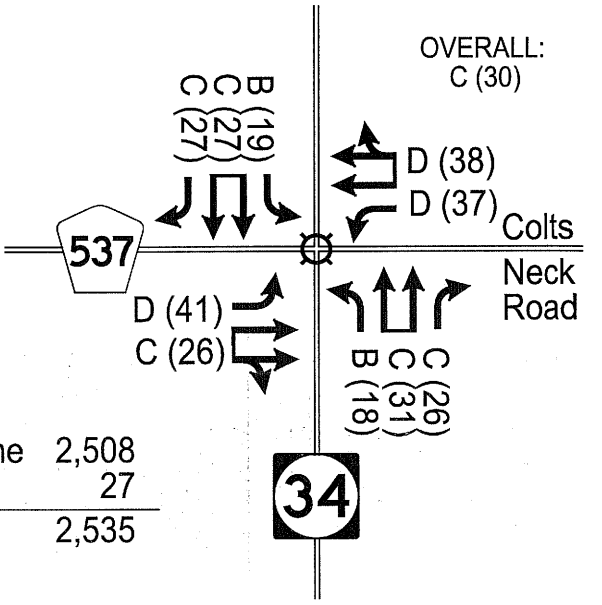
N

Peak Hour Traffic Volumes

Peak Hour Levels of Service

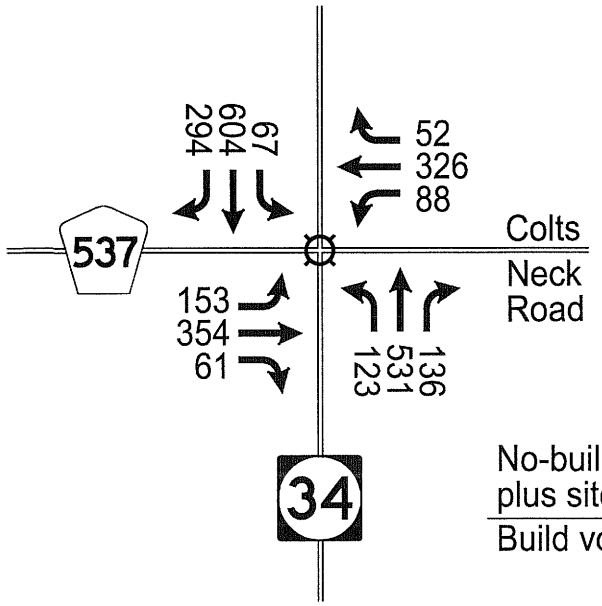
Weekday Morning Peak Hour

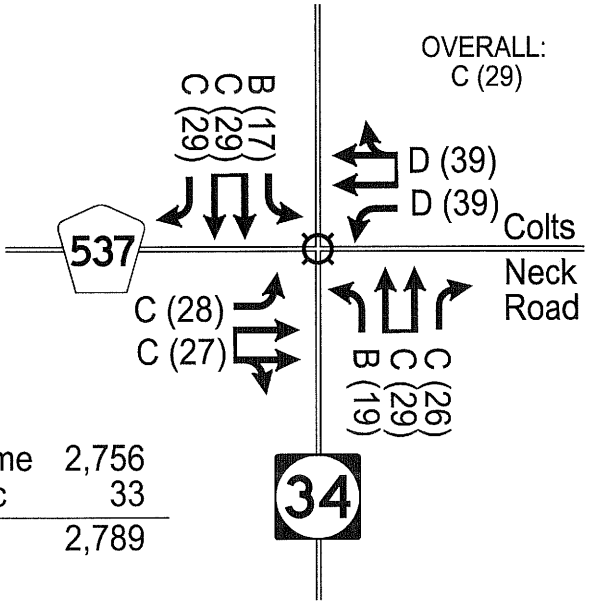




No-build volume	2,508
plus site traffic	27
Build volume	2,535

Weekday Evening Peak Hour





No-build volume	2,756
plus site traffic	33
Build volume	2,789

LEGEND

Existing Traffic Signal

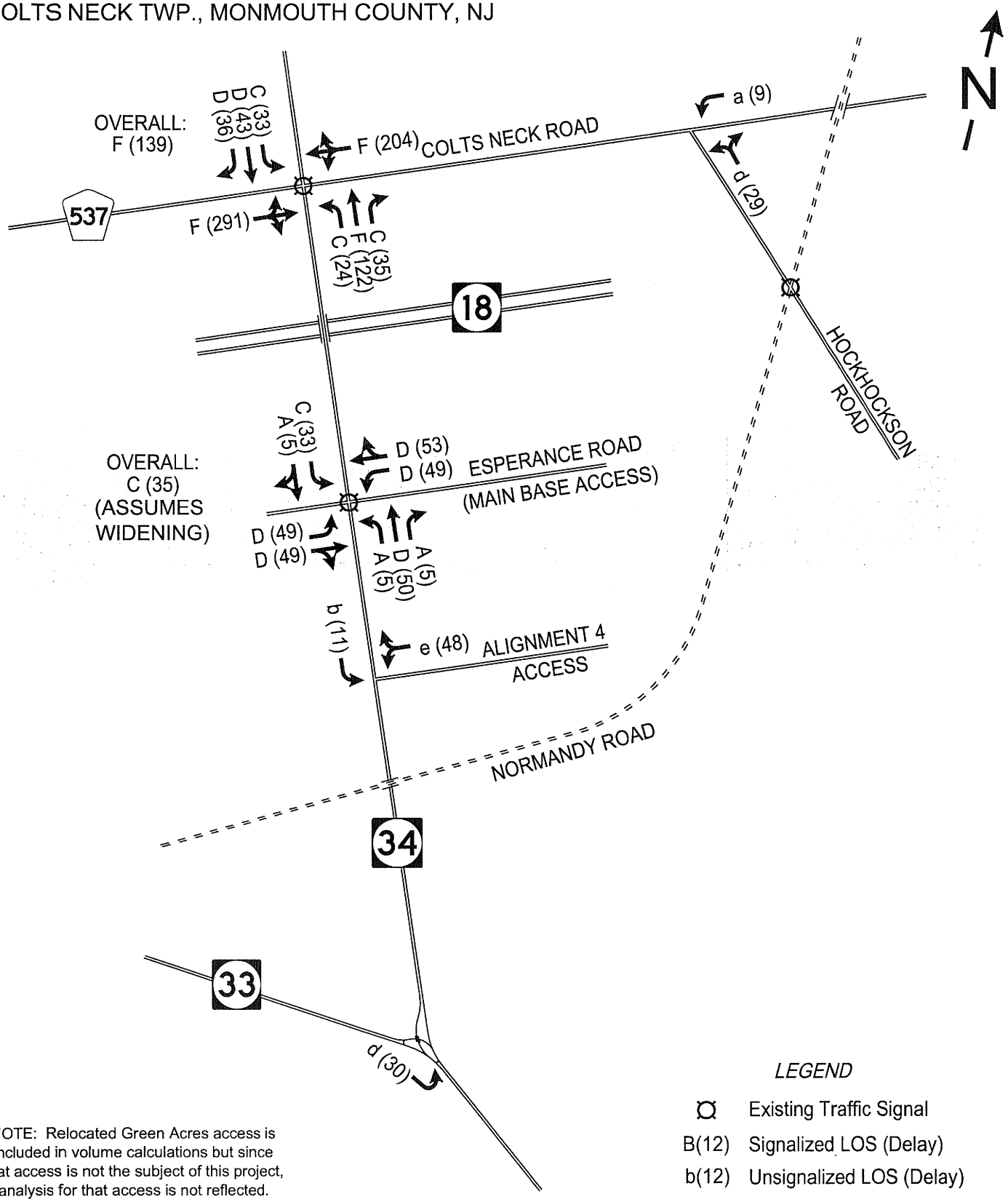
B(12) Signalized LOS (Delay)

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 27

Projected Future Year 2010 Full-Build Weekday Morning Peak Hour Levels of Service - ALIGNMENT 4

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



LEGEND

- ☼ Existing Traffic Signal
- B(12) Signalized LOS (Delay)
- b(12) Unsignalized LOS (Delay)

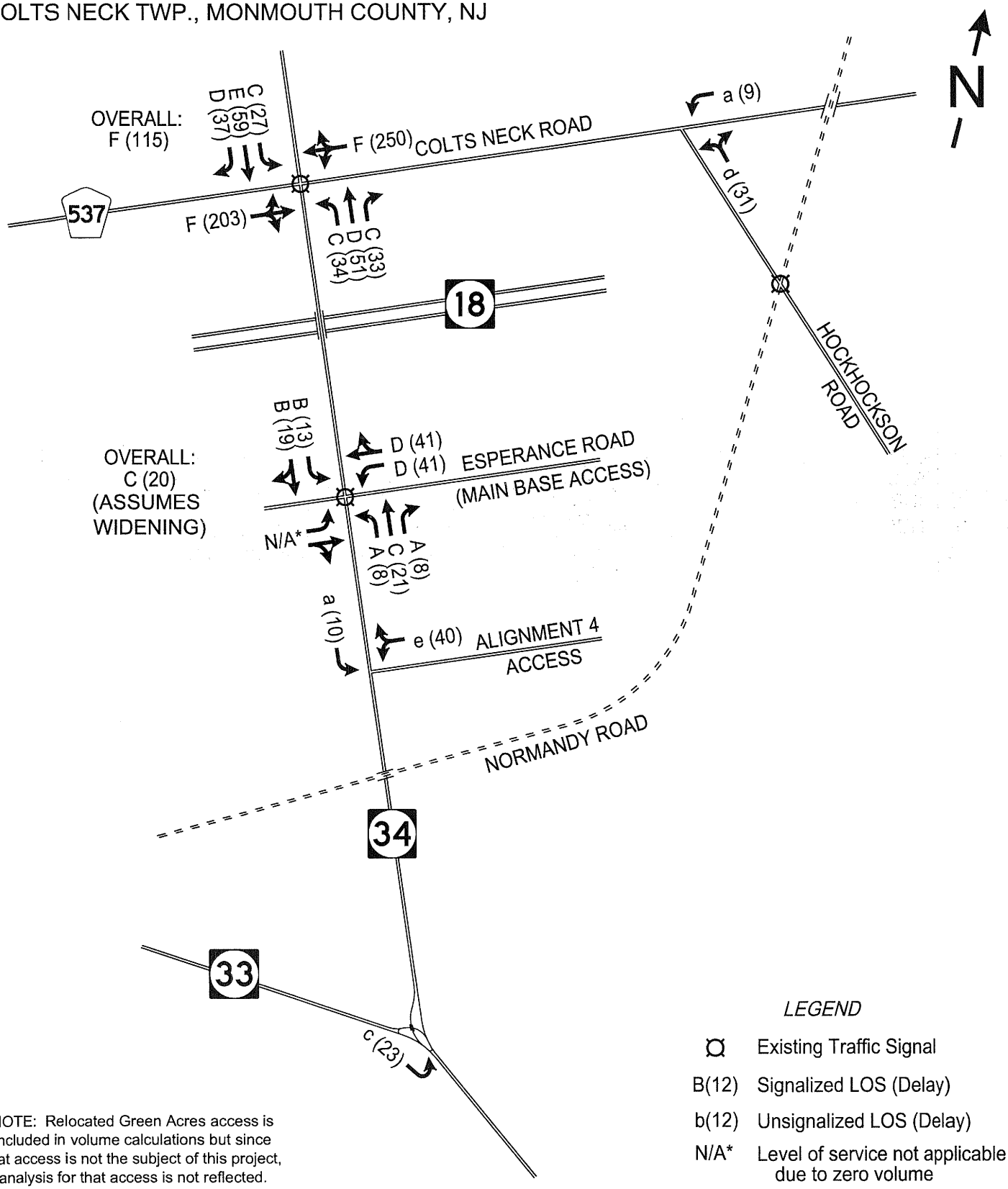
NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

Orth - Rodgers and Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 28

Projected Future Year 2010 Full-Build Weekday Evening Peak Hour Levels of Service - ALIGNMENT 4

NAVAL WEAPONS STATION EARLE
COLTS NECK TWP., MONMOUTH COUNTY, NJ



LEGEND

⌑	Existing Traffic Signal
B(12)	Signalized LOS (Delay)
b(12)	Unsignalized LOS (Delay)
N/A*	Level of service not applicable due to zero volume

NOTE: Relocated Green Acres access is included in volume calculations but since that access is not the subject of this project, analysis for that access is not reflected.

APPENDIX B

AIR QUALITY CALCULATIONS AND RECORD OF NON-APPLICABILITY

Air quality impacts were estimated for the road construction action proposed for Laurelwood housing area access. The following is a discussion of the assumptions, references and methods used to perform the air emission estimate calculations for construction and related activities.

CONSTRUCTION

Air quality impacts from proposed construction activities were estimated from (1) combustion emissions due to the use of fossil fuel-powered equipment; (2) fugitive dust emissions (PM_{10} and $PM_{2.5}$) during demolition activities, earth-moving activities, and the operation of equipment on bare soil; and (3) VOC emissions from application of asphalt materials during paving operations.

The analysis assumed that all land-based construction equipment was manufactured before 2000. The analysis inherently reduces PM_{10} fugitive dust emissions from earth-moving activities by 50 percent as this control level is included in the emission factor itself.

Off-Road Equipment Emissions – Land Based

The NONROAD model is the EPA standard method for preparing emission inventories for mobile sources that are not classified as being related to on-road traffic, railroads, air traffic, or water-going vessels. As such, it is the starting place for quantifying emissions from construction-related equipment. The NONROAD model uses the following general equation to estimate emissions separately for CO, NOx, PM (essentially all of which is PM2.5 from construction sources), and total hydrocarbons (THC), nearly all of which are non-methane hydrocarbons (NMHC):

EMS = EF * HP * LF * Act * DF

Where:

EMS = estimated emissions

EF = emissions factor in grams per horsepower hours

HP = peak horsepower

LF = load factor (assumed percentage of peak horsepower)

Act = activity in hours of operation per period of operation

DF = deterioration factor

The emissions factor is specific to the equipment type, engine size, and technology type. The technology type for diesel equipment can be “base” (before 1988), “tier 0” (1988 to 1999), or “tier 1” (2000 to 2005). Tier 2 emissions factors could be applied to equipment that satisfies 2006 national standards (or slightly earlier California standards). For this study, all diesel equipment was assumed to be either tier 0 or tier 1.

The load factor is specific to the equipment type in the NONROAD model regardless of engine size or technology type, and it represents the average fraction of peak horsepower at which the engine is assumed to operate. NONROAD model default values were used in all cases. Because Tier 0 and Tier 1 equipment was conservatively used throughout the one year construction period, deterioration factors were not used to estimate increased emissions due to engine age.

Based on the methodology described, it is possible to make a conservative estimate of emissions from off-road equipment if the types of equipment and durations of use are known (see tables following).

Construction calculations were based on the assumption that the road construction activities all occurred during a single year. Information provided by Installation personnel were used to identify information on road alignments, amount of land to be cleared, new road construction, old road rehabilitation, etc.

Fugitive Dust

Emission rates for fugitive dust were estimated using guidelines outlined in the Western Regional Air Partnership (WRAP) fugitive dust handbook (WRAP 2004). Although these guidelines were developed for use in western states, they assume standard dust mitigation best practices activities of 50% from wetting; therefore, they were deemed applicable but conservative for the Northeastern United States. The WRAP handbook offers several options for selecting factors for PM_{10} (coarse PM) depending on what information is known about the locality and action that will produce dust.

After PM_{10} is estimated, the fraction of fugitive dust emitted as $PM_{2.5}$ is estimated, the most recent WRAP study (MRI 2005) recommends the use of a fractional factor of 0.10 to estimate the $PM_{2.5}$ portion of the PM_{10}.

For site preparation activities, the emission factor was obtained from Table 3-2 of the WRAP Fugitive Dust Handbook. The areas of disturbance and approximate durations were used in conjunction with the large scale of land-disturbing activities occurring, resulting in the selection of the first factor with worst-case conditions for use in the analysis.

VOC Emissions from Paving and Pavement Marking

VOC emissions from the application of hot mix asphalt were calculated for the improvements associated with the Laurelwood Housing area alignment alternatives. The estimates used estimated asphalt volumes the published California Air Resources Board (CARB) hot mix asphalt emission factor.

VOC emissions from pavement marking (road and parking lot striping, etc.) were calculated based on the use of acrylic water-based paint containing a commonly formulated quantity of VOCs and using a typical industry application volume.

PM_{10}, $PM_{2.5}$ and Mobile Sources

Diesel exhaust is a primary, well-documented source of $PM_{2.5}$ emissions. The vast majority of PM emissions in diesel exhaust is $PM_{2.5}$. Therefore, all calculated PM is assumed to be $PM_{2.5}$. A corollary result of this is that the PM_{10} fraction of diesel exhaust is estimated very conservatively as only a small fraction of PM_{10} is present in the exhaust. However, ratios of PM_{10} to $PM_{2.5}$ in diesel exhaust are not yet published and therefore for the purposes of the EA calculations, all PM emissions are equally distributed as PM_{10} and $PM_{2.5}$.

References

California Air Resources Board (CARB). 2005. *Comparison of Asphalt Paving Emission Factors*.

Midwest Research Institute (MRI). 2005. MRI Project No. 110397. *Analysis of the Fine Fraction of Particulate Matter in Fugitive Dust*, conducted for the Western Governors Association Western Regional Air Partnership (WRAP). October

Monmouth County (NJ) County Road Department. *Typical County Curb and Pavement Section Details.* Not Date.

New Jersey Department of Transportation. 2001. *Standard Specifications for Road and Bridge Construction* and *Typical County Road Section.*

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USEPA. 2004a. EPA Report No. NR-005c, *Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling*

USEPA. 2004b. EPA Report No. NR-009c, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition*

USEPA. 2004c. EPA 420-P-04-001, NR-002b, *Conversion Factors for Hydrocarbon Emission Components*. April.

Western Regional Air Partnership (WRAP). 2004. *WRAP Fugitive Dust Handbook*. November.

Air Emission Calculations for Alternative Alignments

Alternative Alignment 1:

Site Clearing 2.3 AC

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Dozer	1	6	2	299	0.58	0.68	2.7	8.38	0.93	0.402	3	12	38	4	2
Backhoe/loader	2	8	3	98	0.21	0.99	3.49	6.9	0.85	0.722	2	8	15	2	2
Skid/steer Loader	1	8	2	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	0	1	3	1	0
Dump truck (12 CY)	28	1	3	275	0.21	0.68	2.7	8.38	0.89	0.402	4	14	45	5	2
										Subtotal	9	36	101	11	6

12 AC

Site prep (grading, drainage, utilities etc.)

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Dozer	1	6	10	299	0.58	0.68	2.7	8.38	0.93	0.402	16	62	192	21	9
Backhoe/loader	1	8	26	98	0.21	0.99	3.49	6.9	0.85	0.722	9	33	65	8	7
Grader	1	4	21	135	0.58	0.68	2.7	8.38	0.93	0.402	10	39	122	13	6
Small diesel engines	1	4	21	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	1	3	4	1	0
Dump truck (12 CY)	8	1	26	275	0.21	0.68	2.7	8.38	0.89	0.402	18	72	222	24	11
										Subtotal	53	209	605	67	33

Concrete Work 846 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Skid steer loader	2	2	20	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	1	6	15	3	1
Concrete truck (9 CY)	6	1	24	250	0.21	0.68	2.7	8.38	0.89	0.402	11	45	140	15	7
Dump truck (12 CY)	4	1	24	275	0.21	0.68	2.7	8.38	0.89	0.402	4	17	51	5	2
Delivery truck	4	1	4	180	0.21	0.68	2.7	8.38	0.89	0.402	1	4	11	1	1
Backhoe/loader	2	2	8	98	0.21	0.99	3.49	6.9	0.85	0.722	1	5	10	1	1
Crane	1	4	4	120	0.43	0.3384	0.8667	5.6523	0.93	0.2799	1	2	10	2	1
										Subtotal	19	77	227	25	12

Trenching/Cut/Fill/Excavate 17,512 CY

Equipment	*Number*	*Hr/day*	*days*	*Hp*	*LF*	**VOC** g/hp-hı	**CO** g/hp-hı	**NOx** g/hp-hı	**SO2** g/hp-hı	**PM** g/hp-hı	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Backhoe/loader	1	8	185	98	0.21	0.99	3.49	6.9	0.85	0.722	66	234	463	57	48
Dump truck	8	1	185	275	0.21	0.68	2.7	8.38	0.89	0.402	128	509	1,579	168	76
Delivery truck	1	2	185	180	0.21	0.68	2.7	8.38	0.89	0.402	21	83	258	27	12
Small diesel engines	2	8	185	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	21	115	147	26	13
Trencher	1	8	185	100	0.21	0.99	3.49	6.9	0.85	0.722	68	239	473	58	49
										Subtotal	305	1,181	2,920	337	199

Gravel Work 4,812 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Grader	3	4	44	135	0.58	0.68	2.7	8.38	0.93	0.402	62	246	764	85	37
Skid steer loader	6	4	44	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	19	85	201	33	17
Small diesel engines	3	4	44	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	4	21	26	5	2
Dump truck (12 CY)	10	1	40	275	0.21	0.68	2.7	8.38	0.89	0.402	17	69	213	23	10
										Subtotal	102	420	1,204	145	66

Paving 3601 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Grader	1	4	9	150	0.59	0.68	2.7	8.38	0.93	0.402	5	19	59	7	3
Roller	2	4	9	30	0.59	1.8	5	6.9	1	0.8	5	14	19	3	2
Paver	1	8	9	107	0.59	0.68	2.7	8.38	0.93	0.402	7	27	84	9	4
Delivery truck	2	1	16	180	0.21	0.68	2.7	8.38	0.89	0.402	2	7	22	2	1
										Subtotal	18	67	185	21	10

Volume of hot mix asphalt 97,227 ft^3
Average density of HMA 145 lb/ft^3
CARB EF for HMA 0 lb/ton
VOC emissions from HMA paving 282 lb

Pavement Marking 17,900 LF
4" Solid Line= 215 ft/gal VOC content of paint = 1.3 lb/gal

VOC lb
108

Install perimeter fencing 9027 FT

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Skid steer loader	1	6	29	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	3	14	33	5	3
Small diesel engines	3	8	29	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	5	27	35	6	3
Delivery truck	1	1	29	180	0.21	0.68	2.7	8.38	0.89	0.402	2	7	20	2	1
										Subtotal	10	48	88	14	7

Fugitive Dust Emissions:

PM_{10} tons/acre/mo	acres	days of disturbance	**PM_{10}** Total	**$PM_{2.5}/PM_{10}$** Ratio	**$PM_{2.5}$** Total
0.42	1	120	2	0.1	0.2

Alignment 1 Emission Totals:

VOC T/yr	**CO** T/yr	**NOx** T/yr	**SO2** T/yr	**PM_{10}** T/yr	**$PM_{2.5}$** T/yr
0.45	1.02	2.67	0.31	1.85	0.33

Air Emission Calculations for Alternative Alignments

Alternative Alignment 2:

Site Clearing 2.2 AC 50,000 SF

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Dozer	1	8	2	299	0.58	0.68	2.7	8.38	0.93	0.402	4	17	51	6	2
Backhoe/loader	2	8	4	98	0.21	0.99	3.49	6.9	0.85	0.722	3	10	20	2	2
Skid/steer Loader	1	8	2	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	0	1	3	1	0
Dump truck (12 CY)	28	1	4	275	0.21	0.68	2.7	8.38	0.89	0.402	5	19	60	6	3
										Subtotal	12	47	134	15	8

Site prep (grading, drainage, utilities etc.) 13 AC

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Dozer	1	8	12	299	0.58	0.68	2.7	8.38	0.93	0.402	25	99	308	34	15
Backhoe/loader	1	8	41	98	0.21	0.99	3.49	6.9	0.85	0.722	15	52	103	13	11
Grader	1	8	24	135	0.58	0.68	2.7	8.38	0.93	0.402	23	89	278	31	13
Small diesel engines	1	8	24	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	1	7	10	2	1
Dump truck (12 CY)	8	1	41	275	0.21	0.68	2.7	8.38	0.89	0.402	28	113	350	37	17
										Subtotal	92	361	1047	116	56

Concrete Work 2,036 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Skid steer loader	2	2	18	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	1	6	14	2	1
Concrete truck (9 CY)	6	1	22	250	0.21	0.68	2.7	8.38	0.89	0.402	10	41	128	14	6
Dump truck (12 CY)	4	1	22	275	0.21	0.68	2.7	8.38	0.89	0.402	4	15	47	5	2
Delivery truck	4	1	4	180	0.21	0.68	2.7	8.38	0.89	0.402	1	4	11	1	1
Backhoe/loader	2	2	8	98	0.21	0.99	3.49	6.9	0.85	0.722	1	5	10	1	1
Crane	1	4	4	120	0.43	0.3384	0.8667	5.6523	0.93	0.2799	1	2	10	2	1
										Subtotal	18	71	210	23	11

Trenching/Cut/Fill/Excavate 21,474 CY

Equipment	*Number*	*Hr/day*	*days*	*Hp*	*LF*	VOC g/hp-hı	CO g/hp-hı	NOx g/hp-hı	SO2 g/hp-hı	PM g/hp-hı	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Backhoe/loader	2	3	113	98	0.21	0.99	3.49	6.9	0.85	0.722	30	107	212	26	22
Dump truck	16	1	113	275	0.21	0.68	2.7	8.38	0.89	0.402	157	622	1,929	205	93
Delivery truck	2	1	113	180	0.21	0.68	2.7	8.38	0.89	0.402	13	51	158	17	8
Small diesel engines	2	6	113	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	10	53	67	12	6
Trencher	2	3	113	100	0.21	0.99	3.49	6.9	0.85	0.722	31	110	217	27	23
										Subtotal	241	942	2,583	286	151

Gravel Work 5,984 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Grader	3	4	54	135	0.58	0.68	2.7	8.38	0.93	0.402	76	302	937	104	45
Skid steer loader	6	4	54	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	23	104	247	41	21
Small diesel engines	3	4	54	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	5	25	32	6	3
Dump truck (12 CY)	10	1	48	275	0.21	0.68	2.7	8.38	0.89	0.402	21	83	256	27	12
										Subtotal	124	514	1,472	178	81

Paving 4,385 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Grader	1	4	11	150	0.59	0.68	2.7	8.38	0.93	0.402	6	23	72	8	3
Roller	2	4	11	30	0.59	1.8	5	6.9	1	0.8	6	17	24	3	3
Paver	1	8	11	107	0.59	0.68	2.7	8.38	0.93	0.402	8	33	103	11	5
Delivery truck	2	2	19	180	0.21	0.68	2.7	8.38	0.89	0.402	4	17	53	6	3
										Subtotal	25	91	251	28	14

Volume of hot mix asphalt 118,395 ft^3
Average density of HMA 145 lb/ft^3
CARB EF for HMA 0 lb/ton
VOC emissions from HMA paving 343 lb

Pavement Marking 25,616 LF
4" Solid Line= 215 ft/gal VOC content of paint = 1.3 lb/gal

VOC lb
155

Install perimeter fencing 10199 FT

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	VOC lb	CO lb	NOx lb	SO2 lb	PM lb
Skid steer loader	1	6	34	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	4	16	39	6	3
Small diesel engines	3	8	34	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	6	32	40	7	3
Delivery truck	1	1	34	180	0.21	0.68	2.7	8.38	0.89	0.402	2	8	24	3	1
										Subtotal	11	56	103	16	8

Fugitive Dust Emissions:

PM_{10} tons/acre/mo	acres	days of disturbance	PM_{10} Total	$PM_{2.5}/PM_{10}$ Ratio	$PM_{2.5}$ Total
0.42	0.7	120	1	0.1	0.1

Alignment 2 Emission Totals:

VOC T/yr	CO T/yr	NOx T/yr	SO2 T/yr	PM_{10} T/yr	$PM_{2.5}$ T/yr
0.51	1.04	2.90	0.33	1.29	0.28

Air Emission Calculations for Alternative Alignments

Alternative Alignment 3:

Site Clearing 0.7 AC

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Dozer	1	2	4	299	0.58	0.68	2.7	8.38	0.93	0.402	2	8	26	3	1
Backhoe/loader	1	4	7	98	0.21	0.99	3.49	6.9	0.85	0.722	1	4	9	1	1
Skid/steer Loader	1	2	4	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	0	1	2	0	0
Dump truck (12 CY)	6	1	7	275	0.21	0.68	2.7	8.38	0.89	0.402	2	7	22	2	1
										Subtotal	5	21	58	7	3

Site prep (grading, drainage, utilities etc.) 10 AC

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Dozer	2	2	28	299	0.58	0.68	2.7	8.38	0.93	0.402	29	116	359	40	17
Backhoe/loader	2	2	77	98	0.21	0.99	3.49	6.9	0.85	0.722	14	49	96	12	10
Grader	2	2	49	135	0.58	0.68	2.7	8.38	0.93	0.402	23	91	284	31	14
Small diesel engines	2	2	49	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	1	8	10	2	1
Dump truck (12 CY)	4	1	77	275	0.21	0.68	2.7	8.38	0.89	0.402	27	106	329	35	16
										Subtotal	94	369	1077	120	57

Trenching/Cut/Fill/Excavate 14,572 CY

Equipment	*Number*	*Hr/day*	*days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Backhoe/loader	2	3	77	98	0.21	0.99	3.49	6.9	0.85	0.722	21	73	145	18	15
Dump truck	16	1	77	275	0.21	0.68	2.7	8.38	0.89	0.402	107	424	1,314	140	63
Delivery truck	2	1	77	180	0.21	0.68	2.7	8.38	0.89	0.402	9	35	108	11	5
Small diesel engines	2	6	77	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	7	36	46	8	4
Trencher	2	3	77	100	0.21	0.99	3.49	6.9	0.85	0.722	21	75	148	18	15
										Subtotal	164	642	1,760	195	103

Concrete Work 1,107 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Skid steer loader	2	2	22	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	2	7	17	3	1
Concrete truck (9 CY)	6	1	17	250	0.21	0.68	2.7	8.38	0.89	0.402	8	32	99	11	5
Dump truck (12 CY)	4	1	27	275	0.21	0.68	2.7	8.38	0.89	0.402	5	19	58	6	3
Delivery truck	4	1	5	180	0.21	0.68	2.7	8.38	0.89	0.402	1	5	14	1	1
Backhoe/loader	2	2	10	98	0.21	0.99	3.49	6.9	0.85	0.722	2	6	13	2	1
Crane	1	4	5	120	0.43	0.3384	0.8667	5.6523	0.93	0.2799	1	2	13	2	1
										Subtotal	17	68	200	22	11

Gravel Work 4,001 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Grader	1	6	66	135	0.58	0.68	2.7	8.38	0.93	0.402	46	185	573	64	27
Skid steer loader	1	6	153	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	16	74	175	29	15
Small diesel engines	1	6	66	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	3	15	20	3	2
Dump truck (12 CY)	13	1	27	275	0.21	0.68	2.7	8.38	0.89	0.402	15	60	187	20	9
										Subtotal	81	334	954	116	53

Paving 2,666 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Grader	1	4	7	150	0.59	0.68	2.7	8.38	0.93	0.402	4	15	46	5	2
Roller	2	4	7	30	0.59	1.8	5	6.9	1	0.8	4	11	15	2	2
Paver	1	8	7	107	0.59	0.68	2.7	8.38	0.93	0.402	5	21	65	7	3
Delivery truck	2	2	11	180	0.21	0.68	2.7	8.38	0.89	0.402	2	10	31	3	1
										Subtotal	15	57	157	18	9

Volume of hot mix asphalt 71,982 ft^3
Average density of HMA 145 lb/ft^3
CARB EF for HMA 0 lb/ton
VOC emissions from HMA paving 209 lb

Pavement Marking 16,352 LF
4" Solid Line= 215 ft/gal VOC content of paint = 1.3 lb/gal

VOC lb
99

Install perimeter fencing 9,541 FT

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Skid steer loader	1	6	30	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	3	14	34	6	3
Small diesel engines	3	8	30	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	5	28	36	6	3
Delivery truck	1	1	30	180	0.21	0.68	2.7	8.38	0.89	0.402	2	7	21	2	1
										Subtotal	10	49	91	14	7

Fugitive Dust Emissions:

PM_{10} tons/acre/mo	acres	days of disturbance	**PM_{10}** Total	**$PM_{2.5}/PM_{10}$** Ratio	**$PM_{2.5}$** Total
0.42	0.5	60	0.4	0.1	0.0

Alignment 3 Emission Totals:

VOC T/yr	**CO** T/yr	**NOx** T/yr	**SO2** T/yr	**PM_{10}** T/yr	**$PM_{2.5}$** T/yr
0.35	0.77	2.15	0.25	0.54	0.16

Air Emission Calculations for Alternative Alignments

Alternative Alignment 4:

Site Clearing 1.1 AC

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Dozer	1	6	1	299	0.58	0.68	2.7	8.38	0.93	0.402	2	6	19	2	1
Backhoe/loader	2	8	2	98	0.21	0.99	3.49	6.9	0.85	0.722	1	5	10	1	1
Skid/steer Loader	1	8	1	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	0	1	2	0	0
Dump truck (12 CY)	28	1	2	275	0.21	0.68	2.7	8.38	0.89	0.402	2	10	30	3	1
										Subtotal	6	22	61	7	4

Site prep (grading, drainage, utilities etc.) 19 AC

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Dozer	4	6	55	299	0.58	0.68	2.7	8.38	0.93	0.402	343	1363	4229	469	203
Backhoe/loader	6	8	81	98	0.21	0.99	3.49	6.9	0.85	0.722	175	616	1217	150	127
Grader	6	4	52	135	0.58	0.68	2.7	8.38	0.93	0.402	146	582	1805	200	87
Small diesel engines	4	4	23	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	3	14	18	3	2
Dump truck (12 CY)	16	1	36	275	0.21	0.68	2.7	8.38	0.89	0.402	50	198	615	65	29
										Subtotal	717	2772	7884	888	448

Trenching/Cut/Fill/Excavate 37,177 CY

Equipment	*Number*	*Hr/day*	*days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Backhoe/loader	2	8	240	98	0.21	0.99	3.49	6.9	0.85	0.722	172	608	1,202	148	126
Dump truck	16	1	240	275	0.21	0.68	2.7	8.38	0.89	0.402	332	1,320	4,097	435	197
Delivery truck	2	2	240	180	0.21	0.68	2.7	8.38	0.89	0.402	54	216	670	71	32
Small diesel engines	4	8	240	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	56	299	381	68	33
Trencher	2	8	240	100	0.21	0.99	3.49	6.9	0.85	0.722	176	620	1,227	151	128
										Subtotal	791	3,064	7,577	873	515

Concrete Work 1,402 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Skid steer loader	2	2	30	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	2	10	23	4	2
Concrete truck (9 CY)	6	1	36	250	0.21	0.68	2.7	8.38	0.89	0.402	17	68	210	22	10
Dump truck (12 CY)	4	1	36	275	0.21	0.68	2.7	8.38	0.89	0.402	6	25	77	8	4
Delivery truck	4	1	7	180	0.21	0.68	2.7	8.38	0.89	0.402	2	6	20	2	1
Backhoe/loader	2	2	12	98	0.21	0.99	3.49	6.9	0.85	0.722	2	8	15	2	2
Crane	1	4	7	120	0.43	0.3384	0.8667	5.6523	0.93	0.2799	1	3	18	3	1
										Subtotal	29	116	344	38	18

Gravel Work 8,190 CY

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Grader	3	4	75	135	0.58	0.68	2.7	8.38	0.93	0.402	106	419	1,302	144	62
Skid steer loader	6	4	75	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	32	145	342	57	29
Small diesel engines	3	4	75	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	7	35	45	8	4
Dump truck (12 CY)	10	1	67	275	0.21	0.68	2.7	8.38	0.89	0.402	29	115	357	38	17
										Subtotal	173	714	2,046	247	112

Paving 5,779 CY 156,033 CF

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Grader	1	4	16	150	0.59	0.68	2.7	8.38	0.93	0.402	8	34	105	12	5
Roller	2	4	16	30	0.59	1.8	5	6.9	1	0.8	9	25	34	5	4
Paver	1	8	16	107	0.59	0.68	2.7	8.38	0.93	0.402	12	48	149	17	7
Delivery truck	2	2	26	180	0.21	0.68	2.7	8.38	0.89	0.402	6	23	73	8	3
										Subtotal	35	130	361	41	20

Volume of hot mix asphalt 156,033 ft^3
Average density of HMA 145 lb/ft^3
CARB EF for HMA 0.04 lb/ton
VOC emissions from HMA paving 452 lb

Pavement Marking 17,064 LF
4" Solid Line= 215 ft/gal VOC content of paint = 1.3 lb/gal

VOC lb
103

Install perimeter fencing 21,466 FT

Equipment	*Number*	*Hr/day*	*# days*	*Hp*	*LF*	**VOC** g/hp-hr	**CO** g/hp-hr	**NOx** g/hp-hr	**SO2** g/hp-hr	**PM** g/hp-hr	**VOC** lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb
Skid steer loader	1	6	66	67	0.23	0.5213	2.3655	5.5988	0.93	0.473	7	32	75	13	6
Small diesel engines	3	8	66	10	0.43	0.7628	4.1127	5.2298	0.93	0.4474	11	62	79	14	7
Delivery truck	1	1	66	180	0.21	0.68	2.7	8.38	0.89	0.402	4	15	46	5	2
										Subtotal	22	108	200	31	15

Fugitive Dust Emissions:

PM_{10} tons/acre/mo	acres	days of disturbance	**PM_{10}** Total	**$PM_{2.5}/PM_{10}$** Ratio	**$PM_{2.5}$** Total
0.42	1	150	2	0.1	0.2

Alignment 4 Emission Totals:

VOC T/yr	**CO** T/yr	**NOx** T/yr	**SO2** T/yr	**PM_{10}** T/yr	**$PM_{2.5}$** T/yr
1.16	3.46	9.24	1.06	2.67	0.78

DEPARTMENT OF THE NAVY
Clean Air Act - General Conformity Rule
Record of Non-Applicability

Action Proponent: Naval Weapons Station Earle

Location: Monmouth County, Colts Neck, New Jersey

Proposed Action Name: Laurelwood Housing Area Access Road

Date RONA prepared: August 19, 2008

Introduction: The Clean Air Act (CAA) as amended requires federal actions to conform to an approved state implementation plan (SIP) designed to achieve or maintain an attainment designation for air pollutants as defined by the National Ambient Air Quality Standard (NAAQS). The General Conformity Rule (40 CFR 93) implements these requirements for actions occurring in air quality nonattainment or maintenance regions.

The area where NWS Earle is located is classified by the U.S. Environmental Protection Agency as in attainment of the NAAQS for criteria pollutants except for two: moderate nonattainment for ozone (O_3) and nonattainment for $PM_{2.5}$. Additionally, a portion of Monmouth County was designated as nonattainment for carbon monoxide (CO); however, it is now considered in attainment for CO. Accordingly, this area is designated as a maintenance area. Table 1 shows the respective *de minimis* levels for: CO, volatile organic compounds (VOCs) and nitrogen oxides (NO_x) which are precursors to O_3 [also precursors to $PM_{2.5}$] and the third precursor to $PM_{2.5}$, Sulfur Dioxide (SO_2).

Table 1
Criteria Pollutants, *de Minimis* Level, in Monmouth County, New Jersey

Criteria Pollutant	*de minimis* Levels (tons/year)
Volatile Organic compounds VOCs)	[1]50
Oxides of Nitrogen (NO_x)	100
Carbon Monoxide (CO)	100
Sulfur Dioxide (SO_2)	100
PM2.5	100

[1]The *de minimis* threshold for VOCs is for inside an ozone transport region.

Proposed Action Emission Summary: The Proposed Action is to provide unimpeded access between the Laurelwood housing area at mainside NWS Earle and an adjacent state primary or secondary road. This will be accomplished through the granting of a long-term lease for access and the construction of the access road with associated perimeter fence and clear zone.

Nonroad diesel engine emission sources associated with the proposed action were assessed along with emission sources associated with road, fence, and clear zone construction along with construction worker transportation in personally-owned vehicles. The emissions from road construction equipment are based on contributions from engine exhaust as well as fugitive dust

from surface disturbance. Based on the air quality analysis, the maximum estimated emissions would be below conformity *de minimis* levels and would be less than 10 percent of projected regional emissions (Table 2).

Table 2
Estimated Total Net Project Emissions

	Pollutant Tons per Year				
	VOC	NO_x	CO	SO_2	$PM_{2.5}$
One year period maximum emissions	1.16	9.24	3.46	1.06	0.78
General Conformity *De minimis* thresholds	50	100	100	100	100
Exceed threshold	No	No	No	No	No
Monmouth County 2001 Emission Inventory	26,252	18,971	186,883	3,028	3,669
Exceed 10% of regional Emissions	No	No	No	No	No

Sources: 40 CFR 93.153; USEPA 2001

Affected Air Basin: The proposed action is located in the air quality nonattainment region defined by the regulatory boundary of the Consolidated Metropolitan Statistical Area of New York-Northern New Jersey-Long Island NY, comprised of 31 counties located in New York, New Jersey, and Connecticut as well as Pikes County, Pennsylvania. The specific local area of interest within this Consolidated Metropolitan Statistical Area is Monmouth County, New Jersey, where Naval Weapons Station (NWS) Earle is located.

RONA prepared by: NAVFAC Atlantic, Norfolk, Virginia.

Proposed Action Exemptions: The Environmental Protection Agency has ruled that some federal actions are exempted from the requirement for conformity. Section 51.853(c) of the rule lists actions which are exempt from conformity. One of these is leasing wherein the activities conducted will be similar in scope and operation to activities currently being conducted. This action does not meet this requirement because the leasing action is required for the construction of an access road. Associated with the road construction is the need to provide a new perimeter fence and clear zone.

Section 51.853(c)(1) of the rule states that the General Conformity Rule does not apply to "actions where the total of direct and indirect emissions are below the emissions levels specified" [as defined in Sections 51.853(b)(1) and (b)(2)]. As shown in Table 2, the levels of NO_X, VOCs, CO, or SO_2 are not expected to exceed the *de minimis* levels for this action.

Attainment Area Status and Emissions Evaluation Conclusions: The Proposed Action includes construction of a complete and usable paved roadway, perimeter fence, and clear zone connecting the Laurelwood housing area to an adjacent state primary or secondary road. Emissions were calculated using *Median Life, Annual Activity, and Load Factor Values for*

Nonroad Engine Emissions Modeling (USEPA, 2004); *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition* (USEPA, 2004); *Nonroad Engine and Vehicle Emission Study—Report* (USEPA, 1991); *Conversion Factors for Hydrocarbon Emission Components (USEPA 2004);* and *WRAP Fugitive Dust Handbook*, (WRAP, 2004).

The Navy concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded nor would the projected emissions be regionally significant (i.e., greater than 10 percent of the air basin's emission budgets) as a result of implementation of the Proposed Action.

The emissions data supporting that conclusion is shown in Table 2, which is a summary of the calculations, methodology, data, and references included in Appendix B of the EIS. Therefore, the Navy concludes that further formal Conformity Determination procedures are not required.

RONA APPROVAL

To the best of my knowledge, the information presented in this Record of Non-Applicability is correct and accurate and I concur in the finding that the Proposed Action is not subject to the General Conformity Rule.

J. I Contreras LCDR, CEC, USN — 9/12/08

Name (title) — Date

APPENDIX C

DOCUMENTS RELATED TO SCHOOL DESIGNATION

NEW JERSEY STATUTES ANNOTATED
TITLE 18A. EDUCATION
SUBTITLE 6. CONDUCT OF SCHOOLS
PART 2. FACILITIES AND CONDUCT OF SCHOOLS
CHAPTER 38. ATTENDANCE AT SCHOOL
ARTICLE 1. PERSONS WHO MAY ATTEND SCHOOL

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Current through L.2002, c. 23

18A:38-7.8. Pupils resident at **Earle** Naval Ammunition Depot in Monmouth County; designation of district

a. After July 1, 1988, persons of school age who reside on federal property which is located entirely within the geographic boundaries of two or more school districts, one of which is a constituent district of a limited purpose regional district with more than six constituent districts in a county of the fifth class shall be deemed to be domiciled in a district to be designated by the county superintendent of schools. These persons shall attend the schools of the designated district and the designated district shall count these pupils in the resident enrollment of the district for all State aid and all federal funds provided under Pub.L. 81-874, 20 U.S.C. § 236 et seq.

b. The designated district shall be a district that contains within its boundaries a portion of the federal property on which the pupils reside. Not later than 10 days after the effective date of this act, the board of education of any school district that seeks to be designated by the county superintendent of schools pursuant to this section shall adopt a resolution by majority vote of its members indicating its interest and the resolution shall be forwarded to the county superintendent. Based on a determination of the best interests of the pupils residing on federal property and pupils residing in the districts seeking designation, the county superintendent shall, within 30 days of the effective date of this act, certify to the Commissioner of Education which local school district, if any, shall be the designated district. Once the county superintendent has certified the designated district, the county superintendent may not revoke or alter that certification. In the event that no board of education adopts a resolution indicating an interest in being designated pursuant to this section, the county superintendent shall not designate a district and the pupils residing on the federal property shall attend the schools of the district in which they reside.

c. Notwithstanding the provisions of this section, those pupils residing on federal property prior to October 1, 1987 shall be permitted at the option of each pupil to continue in the school they were attending on September 30, 1987 until graduation from the school. For the purpose of calculating State and federal aid, each pupil who elects to remain shall continue to be included in the resident enrollment of the district in which they reside.

THE TINTON FALLS SCHOOLS BOARD OF EDUCATION
Emergency Meeting Minutes
April 11, 1988

Meeting called to Order.
The Board of Education of The Tinton Falls Schools, in the County of Monmouth, New Jersey, convened in Emergency Session on Monday, April 11, 1988 at 5:00 P.M. in the Tinton Falls Schools Administration Office.

Roll Call Attendance.
Those present: Mesdames Barrett, Cohen and Simko and Messrs. Waters, Bailey, DaPonte and Kline. Messrs. Holley and Sherrod were absent. Also present was Dr. Ashley, Superintendent.

Resolution - Cross Districting Plan:

WHEREAS, appropriate legislation re United States Navy and cross districting has been passed by both House of the New Jersey Legislature, and

WHEREAS, Governor Kean has signed said legislation, and

WHEREAS, this legislation would permit children of Naval personnel at Earle to attend Tinton Falls Schools,

NOW THEREFORE BE IT RESOLVED that the Board directs the Superintendent to make application to the County Superintendent, on behalf of the Board, that children of all naval personnel at Earle be assigned to the Tinton Falls School District effective September 1, 1988, and

the Board directs the Superintendent to take all appropriate steps, as possible, to secure possible sources of revenue and aide.

Move - DaPonte, second - Barrett, passed unanimnously.

Motion to adjourn.
Motion - Kline, second - Barrett, passed unanimnously.

Respectfully submitted,
Mark Resnick

Mark Resnick
Board Secretary/
Business Administrator

BOARD OF EDUCATION
THE TINTON FALLS SCHOOLS
658 TINTON AVENUE
TINTON FALLS, NEW JERSEY 07724

TEL. 201-542-0444

0 P.M.

April 11, 1988

EMERGENCY MEETING
AGENDA

- Meeting Called to Order
- Roll Call Attendance:

Raymond Waters	Florence Cohen	John Kline
Nancy Barrett	Ronald DaPonte	Michael Sherrod
Gene Bailey	James Holley	Eva Simko

- Resolution - Cross Districting Plan:
  MOTION____SECOND____
- Motion to Adjourn:
  MOTION_____SECOND_____

State of New Jersey

DEPARTMENT OF EDUCATION
MONMOUTH COUNTY SUPERINTENDENT
CAMPBELL COURT & HIGHWAY 9
P.O. BOX 1264
FREEHOLD, NEW JERSEY 07728-1264
(201) 431-7810

MILTON G. HUGHES
SUPERINTENDENT

SAUL COOPERMAN
COMMISSIONER

April 25, 1988

Dr. Saul Cooperman, Commissioner
New Jersey Department of Education
CN 500
Trenton, New Jersey 08625-0500

Dear Commissioner Cooperman:

Pursuant to Chapter 12, Laws of 1988 (A-2456), I have received a resolution by majority vote of The Tinton Falls Schools Board of Education requesting designation as the district to receive the pupils who reside on the federal property known as NWS Earle.

Based upon my determination of the best interest of the pupils residing on said federal property and the pupils residing in the Tinton Falls School District, I hereby designate the Tinton Falls School District as the district to receive the students residing on federal property, pursuant to Chapter 12, Laws of 1988.

Sincerely yours,

Milton G. Hughes
County Superintendent of Schools

MGH:np:Alle:D1

c: Dr. Larry Ashley
Mr. Gene Bailey
Mr. Vincent B. Calabrese
Dr. Norman J. Field
Mrs. Carolyne Saltzbart
Mr. David G. Kostka
Dr. Walter J. McCarroll
Dr. Daniel McGuire
Capt. Edwin Nickleson
Dr. Jamie Savedoff
Mr. Robert Swissler
Dr. Frank Volpe

REPRODUCED AT GOVERNMENT EXPENSE

MEMORANDUM OF AGREEMENT
BETWEEN THE DEPARTMENT OF THE NAVY
AND
THE BOARD OF EDUCATION OF THE TINTON FALLS SCHOOLS

This MEMORANDUM OF AGREEMENT (MOA), made and entered into as of the 16th day of June, 19 88, by and between the Department of the Navy, (hereinafter referred to as the "Navy") and the Board of Education of the Tinton Falls Schools, Tinton Falls, New Jersey, (hereinafter referred to as the "Board").

WITNESSETH

WHEREAS, the Navy has filed a Final Environmental Impact Statement (FEIS) which proposes to construct military family housing at the Naval Weapons Station (NWS) Earle; and

WHEREAS, the children of personnel who will occupy such housing have a need to be educated in the State of New Jersey public schools; and

WHEREAS, the Board is charged with the responsibility of providing elementary and intermediate school education to all children within the Tinton Falls community; and

WHEREAS, the Tinton Falls schools are at capacity due to rapid growth in the community; and

WHEREAS, on April 6, 1988 special legislation (Chapter 12, Laws of 1988 (A-2456)) was enacted by the State of New Jersey which will allow Navy dependent children residing on NWS Earle to attend Tinton Falls schools; and

WHEREAS, the Board, pursuant to the legislation has passed resolutions on April 11 and 13, 1988 requesting that the Monmouth County Superintendent of Schools designate Tinton Falls as the School District to educate children residing on NWS Earle; and

WHEREAS, on April 25, 1988 the Monmouth County Superintendent of Schools approved the redistricting request and, as a result, the Tinton Falls District is required by the laws of the State of New Jersey to provide free public education to the children residing on NWS Earle; and

WHEREAS, both parties recognize that present facilities are at capacity and that additional facilities are required in the short term and in the long term to assure high quality education for the projected increase in student population; and

WHEREAS, the Board certifies that, other than as provided herein, there are no state or federal funds available to lease temporary classrooms; and

WHEREAS, the Board certifies that tax revenues will not be expended for provision of temporary classrooms for such children.

NOW THEREFORE, the parties hereto mutually agree as follows:

1. The Navy shall:

a. subject to fulfillment of provisions 2b. and 2c. of this MOA, provide the Board with funds up to ONE MILLION, THREE HUNDRED, SIXTY THOUSAND DOLLARS ($1,360,000) to lease and install temporary classrooms for school years 1988-89 and 1989-90. Said funds will be provided in accordance with a subsequent agreement by and between the Navy and the Board. It is the understanding of the parties that such funds will be provided in accordance with Congressional funding authority;

b. subject to the availability of annual appropriations, provide the Board with funds up to FIVE HUNDRED FIFTY-FOUR THOUSAND DOLLARS ($554,000) each year, beginning with the 1990-91 school year, to lease the temporary classrooms described in 1a. above, until either the construction/ acquisition of permanent facilities or July 1, 1993, whichever occurs first;

c. inform the Board when they will commence with construction of family housing; and

d. provide, via NWS Earle, updated school enrollment numbers as they become available.

2. The Board shall:

a. support and actively pursue actions, including seeking state and federal funding to obtain permanent facilities;

b. certify to the Navy the number of temporary classrooms which will be needed due to the impact of Navy students; and

c. certify to the Navy that other than as provided in this MOA, there are no funds available for lease or purchase of temporary classrooms.

3. The parties shall enter into a subsequent agreement concerning implementation of this MOA. Said agreement shall address issues of mutual concern and will include, but not be limited to: funding terms, payment schedule, and quality of facilities.

IN WITNESS WHEREOF, the parties hereto do mutually covenant and agree to the terms and conditions of this Memorandum of Agreement.

BOARD OF EDUCATION
OF TINTON FALLS

By Gene C. Bailey
GENE BAILEY, President
Board of Education,
Tinton Falls Schools

Date: June 20, 1988

DEPARTMENT OF THE NAVY

By
FRED STERNS, Director,
Installations and Facilities
Office of the Assistant
Secretary of the Navy
(Shipbuilding & Logistics)

Date: 16 June 1988

APPENDIX D

NEW JERSEY STATE HISTORIC PRESERVATION OFFICE CORRESPONDENCE

HPO- A2009-154
Log # 08-1682-2,-3 VM

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
NATURAL & HISTORIC RESOURCES, HISTORIC PRESERVATION OFFICE
PO Box 404, Trenton, NJ 08625
TEL: (609) 984-0176 FAX: (609) 984-0578
www.state.nj.us/dep/hpo

JON S. CORZINE
Governor

MARK N. MAURIELLO
Acting Commissioner

January 23, 2009

Mr. R. David Curfman
Environmental Business Line Manager
NEPA Infrastructure Section
Environmental Planning Branch
Department of the Navy
Naval Facilities Engineering Command
Atlantic
6506 Hampton BLVD
Norfolk, Virginia 23508-1278

Dear Mr. Curfman:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 CFR Part 800: Protection of Historic Properties, as published with amendments in the Federal Register on 6 July 2004 (69 FR 40544-40555), I am providing **Consultation Comments** for the following proposed undertaking:

Monmouth County, Colts Neck Township
Phase I & II Cultural Resources Surveys
Proposed Laurelwood Access Road Alignments
Naval Weapons Station Earle
U.S. Department of the Navy

The following comments are in reply to the following cultural resource report, found to be acceptable as prepared, received for review at the Historic Preservation Office (HPO) on December 15, 2008:

Leary, Susan, Kelly Mitchell, Isla Nelson and Teresa Rudolph
November 2008 *Phase I and II Cultural Resources Survey at Naval Weapons Station Earle, Colts Neck, New Jersey, Monmouth County (Final).* Prepared by TEC, Inc., Boise, ID. Prepared for the Navy Facilities Engineering Command, Atlantic Division, Norfolk, VA.

HPO- A2009-154
Log # 08-1682-2,-3 VM

800.4 Identifying Historic Properties

The proposed alignment for both Alternatives 2 and Alternatives 3 contains Quarters A, B, and C determined eligible for listing on the New Jersey and National Registers of Historic Places.

I *concur* with the above-referenced report findings that the isolated archaeological find spots (NWS-5 through NWS-9), the Pre-Contact period Native American lithic scatter site (28-Mo-382), the archaeologically disturbed early-nineteenth century historic site (28-Mo-383), and the early-twentieth century historic sheet midden site (28-Mo-384) identified within the four proposed road alignments (Alternatives 1 through 4) and jug-handle location (Area 5) are not eligible for listing on the New Jersey and National Registers of Historic Places.

I *disagree*, however, with the report finding that the early-twentieth century historic site (28-Mo-381) is eligible for listing on the New Jersey and National Registers of Historic Places under Criterion D. Based upon the documentation submitted, site 28-Mo-381 does not have the potential to contribute significant information in history beyond what has already been documented. Therefore, no archaeological historic properties will be affected by the proposed undertaking.

800.5 Assessment of Adverse effects

Ms. Kimberly Joyner-Banty's June 18, 2008 letter to the HPO stated the proposed Alternatives 2 and Alternatives 3 alignments will not adversely effect the National Register-eligible Quarters A, B, and C. I **concur with this finding of no adverse effect to historic properties.**

Therefore, as proposed, the project will not adversely affect historic properties. Pursuant to 36 CFR 800.5(c), the project may proceed, as proposed, unless resources are discovered during project implementation, pursuant to 36 CFR 800.13.

Additional Comments:

Thank you again for providing the opportunity to review and comment on the potential for the above-referenced undertaking to affect historic properties. If you have any questions, please feel free to contact Vincent Maresca of my staff at (609) 633-2395 or vincent.maresca@dep.state.nj.us.

Sincerely,

Daniel D. Saunders
Deputy State Historic Preservation Officer

CC: Ms. Kimberly Joyner-Banty, U.S. NAVY (via fax)
Mr. Ken Koschek, Office of Permit Coordination & Environmental Review

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC
6506 HAMPTON BLVD
NORFOLK VA 23508-1278

TELEPHONE NO:
(757) 322-8473
IN REPLY REFER TO:

5090
EV21KGB:lfm
December 4, 2008

Mr. Terry Karschner
Acting Administrator
New Jersey Department of Environmental Protection
Natural and Historic Resources
Historic Preservation Office
P.O. Box 404
Trenton, NJ 08625-0404

SUBJ: FINAL PHASE I AND II CULTURAL RESOURCES SURVEY AT NAVAL WEAPONS STATION EARLE, COLTS NECK, NEW JERSEY, MONMOUTH COUNTY

Dear Mr. Karschner:

Thank you for your consultation comments dated July 23, 2008, regarding our Phase I and II Cultural Resources Surveys (two separate reports). This attached final version of our archaeological investigation has been substantially revised. In this new version, we combined the Phase I and Phase II reports into a single volume and made tables and figures consistent. We also greatly expanded the historic background and the site descriptions and eligibility evaluations. Your specific consultation comments and the changes that were made in response are described below.

1. The report does not contain the resume of the author(s) in accord with the HPO's *Guidelines for Phase I Archaeological Investigations: Identification of Archaeological Resources* and *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office.* These guidelines can be obtained at: http://www.nj.go/dep/hpo/1identify/survarkeo.htm. In addition, the inclusion of a resume is necessary to document that the author(s) meet the appropriate *Secretary of the Interior's Professional Qualification Standards* for archaeology and historic preservation (48 FR 44738-9). Please submit the appropriate resume(s) for the project supervisor(s) and author(s).

   Resumes for the Principal Investigator (Teresa Rudolph) and the Field Director and principle author (Susan Leary) are included in Appendix D. They both meet the Secretary of the Interior's Professional Qualification Standards.

2. The report does not contain any detailed (e.g., those showing structures) historic period atlases, USGS, aerial photographs and/or insurance maps. The inclusion of historic cartographic information is an important factor in documenting previous land-use, occupation, and areas of previous ground disturbance within the APE. This information is important for informed project planning, site excavation strategy, and resource interpretation. Please submit detailed historic cartographic sources with revisions to the background research and conclusions sections as needed.

   Historic maps and census information have been added to the background research (sections 3.3 and 3.4) as well as to the results and evaluations of the sites recorded during the survey (section 5.0). The background history of the Colts Neck area has been greatly expanded to include census information and details on the historic occupation of the project area.

3. While a general review of previous cultural resource studies within NWS Earle were summarized, previous archaeological findings within the above-cited undertaking's APE were not incorporated into the background research or results section of the report. Specifically, the findings in Sheehan and Jensen's 1984 Phase I archaeological survey for proposed family housing (Test Pit 11). This report is accessioned within the HPO report reference library as MON Q2.

   A detailed description of the previous investigations in the APE has been added, which includes a discussion of Sheehan and Jensen's excavations in 1984. Their results support our interpretations and provide additional evidence of demolition and disturbance of historic structures during the early establishment of NWS Earle.

4. The HPO's *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office* requires original copies of photographs within submitted reports. If original photographs are not used, a copy of the digital photographs must be included on a CD within an accompanying pocket at the rear of the report.

   A CD with digital copies of the photographs has been included, along with black and white original photographs taken in the field.

5. Individual subsurface testing locations are not clearly identified on the site plans for understanding the narrative or for independent evaluation of the archaeological data. Please label each shovel test location or, alternatively, label the beginning and end of each alignment (if sequentially numbered).

We have expanded the number of figures and have labeled each shovel test pit so that it can be easily compared to tables and the text.

6. For future work in New Jersey, the HPO recommends during Phase I survey conducting four additional tests at 10-foot (3 meter) intervals in the four cardinal directions around an "isolated" test location to confirm the find is indeed isolated thereby informing the decision for additional phases of investigation.

   During additional Phase I survey, TEC excavated at least four shovel test pits in the four cardinal directions around isolated positive test locations. Where multiple positive tests occurred, we used closely spaced shovel tests to define site boundaries. This information has been incorporated into report and discussed in both the methods section (4.0) and the results section (5.0).

7. The HPO is not currently able to independently evaluate the eligibility of archaeological sites 28-Mo-282 and 28-Mo-283 based on the submitted information. The following issues must be addressed and included in the revised report:

   a. The Phase II report does not include any background research for these historic properties including either cartographic information (discussed in No. #2 above), local or regional histories, deed research, or civic/industrial census data. Therefore, complete evaluation of these historic properties is not possible at this time. Please revise the Phase II report including a synthesis of historic, cartographic, deed, and census data information within the background fieldwork, and evaluation sections of the report.

   Historic, cartographic, and census information have been added to the background research and incorporated into the site evaluations. Graphic comparisons of the locations of the historic sites and the historic maps are presented as part of the site description and interpretation.

   b. It is appropriate to discuss archaeological findings within excavation units by stratigraphic level and not by arbitrary levels with commiserate analysis and synthesis of their respective cultural period, development, and/or function. For example, is the second stratum of Unit 1 (site 28-Mo-383) a cultural feature, buried living surface, fill, etc. Please revise the Phase II report discussing the cultural evolution of the stratigraphy and any identified cultural features.

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EV21KGB:lfm
December 4, 2008

All soil profiles and excavation levels have been described in terms of stratigraphic level. Where possible, we have discussed the context and identified features, fill, or deposits.

c. Subsurface cultural horizons and features were identified but the level of effort was not adequate to identify the limits of these features. This information is necessary for the recordation of the archaeological site limits and for consideration during any site avoidance or mitigation recommendations.

We have expanded all of the site descriptions to discuss in detail the horizontal as well as the vertical distribution of cultural materials and features. All site boundaries were delineated by the excavation of shovel test pits at 5- meter intervals with boundaries identified by the occurrence of several negative test pits.

Based on the results of the revised study, we request your concurrence on our conclusion that the proposed action will have no effect on cultural resources. We would appreciate your response within 30 days.

If you have any questions or concerns regarding this project or would like to schedule a meeting to discuss this project, please contact Kimberly G. Joyner-Banty, Project Manager at (757) 322-8473 or email kimberly.joynerbanty@navy.mil or Mr. Bruce Larson, Senior Cultural Resource Specialist and Archaeologist at (757) 322-4885 or email bruce.larson@navy.mil.

Sincerely,

R. Paul Curfman

R. D. CURFMAN
Environmental Business Line Manager

Encl: Final Phase I and II Cultural Resources Survey at Naval Weapons Station Earle, Colts Neck, New Jersey, Monmouth County

5090
EV21KGB:lfm
December 4, 2008

Blind copy to: NAVFAC Atlantic (B. Larson, EV52)

HPO-G2008-207 PROD
Log #08-1682-1 VM

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Natural and Historic Resources, Historic Preservation Office
PO Box 404, Trenton, NJ 08625
TEL: (609) 292-2023 FAX: (609) 984-0578
www.state.nj.us/dep/hpo

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

July 23, 2008

Ms. Kimberly Joyner-Banty
Navy Technical Representative
NEPA Infrastructure Section
Environmental Planning Branch
Department of the Navy
Naval Facilities Engineering Command
Atlantic
6506 Hampton BLVD
Norfolk, Virginia 23508-1278

Dear Ms. Joyner-Banty:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 CFR Part 800: Protection of Historic Properties, as published with amendments in the Federal Register on 6 July 2004 (69 FR 40544-40555), I am providing **Consultation Comments** for the following undertaking:

Monmouth County, Colts Neck Township
Phase I & II Cultural Resources Surveys
Proposed Laurelwood Access Road Alignments
Naval Weapons Station Earle

800.4 Identifying Historic Properties

These Consultation Comments are in response to the following submitted cultural resource reports received at the Historic Preservation Office (HPO) on July 1, 2008:

No author
November 2007 — *Phase I Cultural Resources Survey, Naval Weapons Station Earle, Colts Neck, New Jersey.* Prepared by TEC, Inc. Prepared for the Department of the Navy.

And

Rudolph, Teresa, Susan Leary, Kelly Mitchell and Isla Nelson

June 2008 — *Phase I and II Cultural Resources Survey at Naval Weapons Station Earle, Colts Neck, New Jersey, Monmouth County.* Prepared by TEC, Inc. Prepared for the Navy Facilities Engineering Command, Atlantic Division.

The HPO has reviewed both of **the above-cited archaeological reports and determined them to be technically incomplete for the identification and evaluation of historic properties** within the undertaking's area of potential effects (APE) pursuant to 36 CFR § 800.4.

Additional Comments

The following issues regarding the November 2007 Phase I Cultural Resources Survey must be addressed and a revised copy resubmitted to the HPO:

1. The report does not contain the resume of the author(s) in accord with the HPO's *Guidelines for Phase I Archaeological Investigations: Identification of Archaeological Resources* and *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office*. These guidelines can be obtained at: http://www.nj.gov/dep/hpo/1identify/survarkeo.htm. In addition, the inclusion of a resume is necessary to document that the author(s) meet the appropriate *Secretary of the Interior's Professional Qualification Standards* for archaeology and historic preservation (48 FR 44738-9). Please submit the appropriate resume(s) for the project supervisor(s) and author(s).
2. The report does not contain any detailed (e.g., those showing structures) historic period atlases, USGS, aerial photographs and/or insurance maps. The inclusion of historic cartographic information is an important factor in documenting previous land-use, occupation, and areas of previous ground disturbance within the APE. This information is important for informed project planning, site excavation strategy, and resource interpretation. Please submit detailed historic cartographic sources with revisions to the background research and conclusion sections as needed.
3. While a general review of previous cultural resource studies within NWS Earle were summarized, previous archaeological findings within the above-cited undertaking's APE were not incorporated into the background research or results section of the report. Specifically, the findings in Sheehan and Jensen's 1984 Phase I archaeological survey for proposed family housing (Test Pit 11). This report is accessioned within the HPO report reference library as MON Q2.
4. The HPO's *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office* requires original copies of photographs within submitted reports. If original photographs are not used, a copy of the digital photographs must be included on a CD within an accompanying pocket at the rear of the report.
5. Individual subsurface testing locations are not clearly identified on the site plans for understanding the narrative or for independent evaluation of the archaeological data. Please label each shovel test location or, alternatively, label the beginning and end of each alignment (if sequentially numbered).
6. For future work in New Jersey, the HPO recommends during Phase I survey conducting four additional tests at 10-foot (3 meter) intervals in the four cardinal directions around

an "isolated" test location to confirm the find is indeed isolated thereby informing the decision for additional phases of investigation.

The following issues regarding the June 2008 Phase I & II Cultural Resources Survey must be addressed and a revised copy resubmitted to the HPO:

1. The report does not contain the resume of the author(s) in accord with the HPO's *Guidelines for Phase I Archaeological Investigations: Identification of Archaeological Resources* and *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office*. These guidelines can be obtained at: http://www.nj.gov/dep/hpo/1identify/survarkeo.htm. In addition, the inclusion of a resume is necessary to document that the author(s) meet the appropriate *Secretary of the Interior's Professional Qualification Standards* for archaeology and historic preservation (48 FR 44738-9). Please submit the appropriate resume(s) for the project supervisor(s) and author(s).
2. The report does not contain any detailed (e.g., those showing structures) historic period atlases, USGS, aerial photographs and/or insurance maps. The inclusion of historic cartographic information is an important factor in documenting previous land-use, occupation, and areas of previous ground disturbance within the APE. This information is important for informed project planning, site excavation strategy, and resource interpretation. Please submit detailed historic cartographic sources with revisions to the background research and conclusion sections as needed.
3. While a general review of previous cultural resource studies within NWS Earle were summarized, previous archaeological findings within the above-cited undertaking's APE were not incorporated into the background research or results section of the report. Specifically, the findings in Sheehan and Jensen's 1984 Phase I archaeological survey for proposed family housing (Test Pit 11). This report is accessioned within the HPO report reference library as MON Q2.
4. The HPO's *Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office* requires original copies of photographs within submitted reports. If original photographs are not used, a copy of the digital photographs must be included on a CD within an accompanying pocket at the rear of the report.
5. The HPO is not currently able to independently evaluate the eligibility of archaeological sites 28-Mo-282 and 28-Mo-383 based on the submitted information. The following issues must be address and included in the revised report:
    A. The Phase II report does not include any background research for these historic properties including either cartographic information (discussed in No. #2 above), local or regional histories, deed research, or civic/industrial census data. Therefore, complete evaluate of these historic properties is not possible at this time. Please revise the Phase II report including a synthesis of historic, cartographic, deed, and census data information within the background, fieldwork, and evaluation sections of the report.
    B. It is appropriate to discuss archaeological findings within excavation units by stratigraphic level and not by arbitrary levels with commiserate analysis and synthesis of their respective cultural period, development, and/or function. For

example, is the second stratum of Unit 1 (site 28-Mo-383) a cultural feature, buried living surface, fill, etc. Please revise the Phase II report discussing the cultural evolution of the stratigraphy and any identified cultural features.

C. Subsurface cultural horizons and features were identified but the level of effort was not adequate to identify the limits of these features. This information is necessary for the recordation of the archaeological site limits and for consideration during any site avoidance or mitigation recommendations.

Thank you again for providing this opportunity for review and comment on the potential for this project to affect historic and archaeological properties. Once the revised Reports (or a single combined revised report) addressing the above-cited deficiencies has been received, the HPO will be able to provide Consultation Comments under Section 106 of the National Historic Preservation Act (as amended). If you have any questions, please do not hesitate to contact Vincent Maresca of my staff at (609) 633-2395 or vincent.maresca@dep.state.nj.us.

Sincerely,

Terry Karschner, Acting Administrator
& Deputy State Historic Preservation Officer

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC
6506 HAMPTON BLVD
NORFOLK VA 23508-1278

TELEPHONE NO:
(757) 322-8473

IN REPLY REFER TO:
5090
EV21KJB:lfm
June 18, 2008

Mr. Terry Karschner
Acting Administrator
New Jersey Department of Environmental Protection
Natural and Historic Resources
Historic Preservation Office
P.O. Box 404
Trenton, NJ 08625-0404

SUBJ: PROPOSED ACCESS ROAD AT NAVAL WEAPONS STATION EARLE, COLTS NECK, NEW JERSEY

Dear Mr. Karschner:

The United States Department of the Navy (U.S. Navy) is proposing to provide unimpeded access between the Laurelwood housing area at mainside Naval Weapons Station (NWS) Earle and New Jersey Route 34. Naval Weapons Station Earle is an 11,035-acre facility located in Monmouth County, New Jersey (Figure 1). The access road is required to satisfy a contractual obligation between the U.S. Navy and the private developer of the housing area. The Navy is preparing an Environmental Impact Statement to evaluate the impacts of this proposed action. The action alternatives include four alignments that provide dedicated access to Laurelwood via new entrances on Route 34 (Figure 2).

Under Section 106 of the National Historic Preservation Act of 1966, as amended, this proposed action is considered an undertaking because the provision of a right-of-way for the construction of the access road by the private developer will require a license or easement and Federal approval. The purposes of this letter are to identify the Areas of Potential Effect (APE); provide a description of our efforts to identify historic properties and archaeological resources and present our finding of no effect; and submit the *Final Phase I Cultural Resources Survey, November 2007* for your reference and follow-on *Draft Final Phase I and II Cultural Resources Survey, June 2008* conducted at NWS Earle for your review and comment.

The APE for this project is defined as a 50-foot (15-meter) wide corridor along the four alternatives or routes between the Laurelwood housing area and Route 34 (refer to Figure 2). Based on previous archaeological work, research on land use history, and recommendations from the Navy, it was determined that most of this area was moderately sensitive for archaeological resources with only a few areas of either low or high potential for containing archaeological resources. In addition, an area referred to as Area 5 in the June 2008 study is located across

Route 34 from the main gate of NWS Earle. It consists of a 250 foot (76-meter) wide corridor along Tarawa Road for a distance of 250 feet (76 meters) (refer to Figure 2).

In October 2007 TEC Inc. conducted a Phase I archaeological survey of the four alternatives (Alternative Alignments 1, 2, 3, and 4) associated with the proposed Laurelwood housing access project (see November 2007 Report). During that survey, three areas with archaeological material were encountered. Cultural materials included a lithic flake, lithic flakes associated with shell, a cluster of historic debris, and a potentially *in situ* brick. On February 20-28, 2008, TEC Inc. conducted Phase II testing at these three locations (see June 2008 Report). In addition, another area, distinct from the four alternative alignments and referred to as Area 5, was subjected to both a Phase I survey and Phase II testing and is discussed in the June 2008 Report.

Based on these studies, the Navy concludes that one National Register of Historic Places (NRHP)-eligible historic archaeological site (28-MO-381) is present in the study area. This site is in the vicinity of Alternative Alignments 1 and 2. None of the other cultural resources encountered during the studies are deemed eligible for the NRHP. If Alternative Alignment 1 or 2 were selected by the Navy as the preferred alternative, the Navy would avoid Site 28-MO-381 during design and construction of the road. Therefore, the proposed undertaking will have no adverse effect to archaeological resources.

All buildings at NWS Earle have been inventoried and NRHP eligibility has been assessed for the buildings. The comprehensive building inventory and assessment can be found in the *Draft Cultural Resources Survey Report, Naval Weapons Station Earle, Colts Neck, New Jersey, Prepared by A.D. Marble & Company, January 2007.*

In a letter dated October 14, 2004 from your office (HPO-J004-93), Ms. Dorothy P. Guzzo, Deputy State Historic Preservation Officer provided comments on the Navy's undertaking of housing privatization at NWS Earle (Attachment 1). In this letter, Ms. Guzzo concurred with the Navy's assessment that Quarters A, B, C and their associated garages are eligible for listing on the NRHP. Quarters A, B, and C are near Alternative Alignments 2 and 3 as shown on Figure 3. If Alternative Alignment 2 or 3 were selected by the Navy as the preferred alternative, none of these structures would be physically altered. Therefore, the proposed undertaking will have no adverse effect to historic properties.

Based on the results of the studies referenced herein, we request your concurrence on our no effect finding for historic properties and archaeological resources. Additionally, please provide comments on the *Draft Final Phase I and II Cultural Resources Survey, June 2008*. We would appreciate your response within 30 days.

5090
EV21KJB:lfm
June 18, 2008

If you have any questions or concerns regarding this project or would like to schedule a meeting to discuss this project, please contact Mr. Bruce Larson, Senior Cultural Resource Specialist and Archaeologist at (757) 322-4885 or email bruce.larson@navy.mil. I can be reached at (757) 322-8473 or email kimberly.joynerbanty@navy.mil.

Thank you for your attention to this matter. I look forward to hearing from you.

Sincerely,

KIMBERLY JOYNER-BANTY
Navy Technical Representative
NEPA Infrastructure Section
Environmental Planning Branch

Encls:

Figure 1: Location of Laurelwood Housing Area at NWS Earle
Figure 2: Laurelwood Housing Area Access Project Alternatives
Figure 3: Historic Structures, NWS Earle
Attachment 1: New Jersey Historic Preservation Office Concurrence Letter Dated October 14, 2004

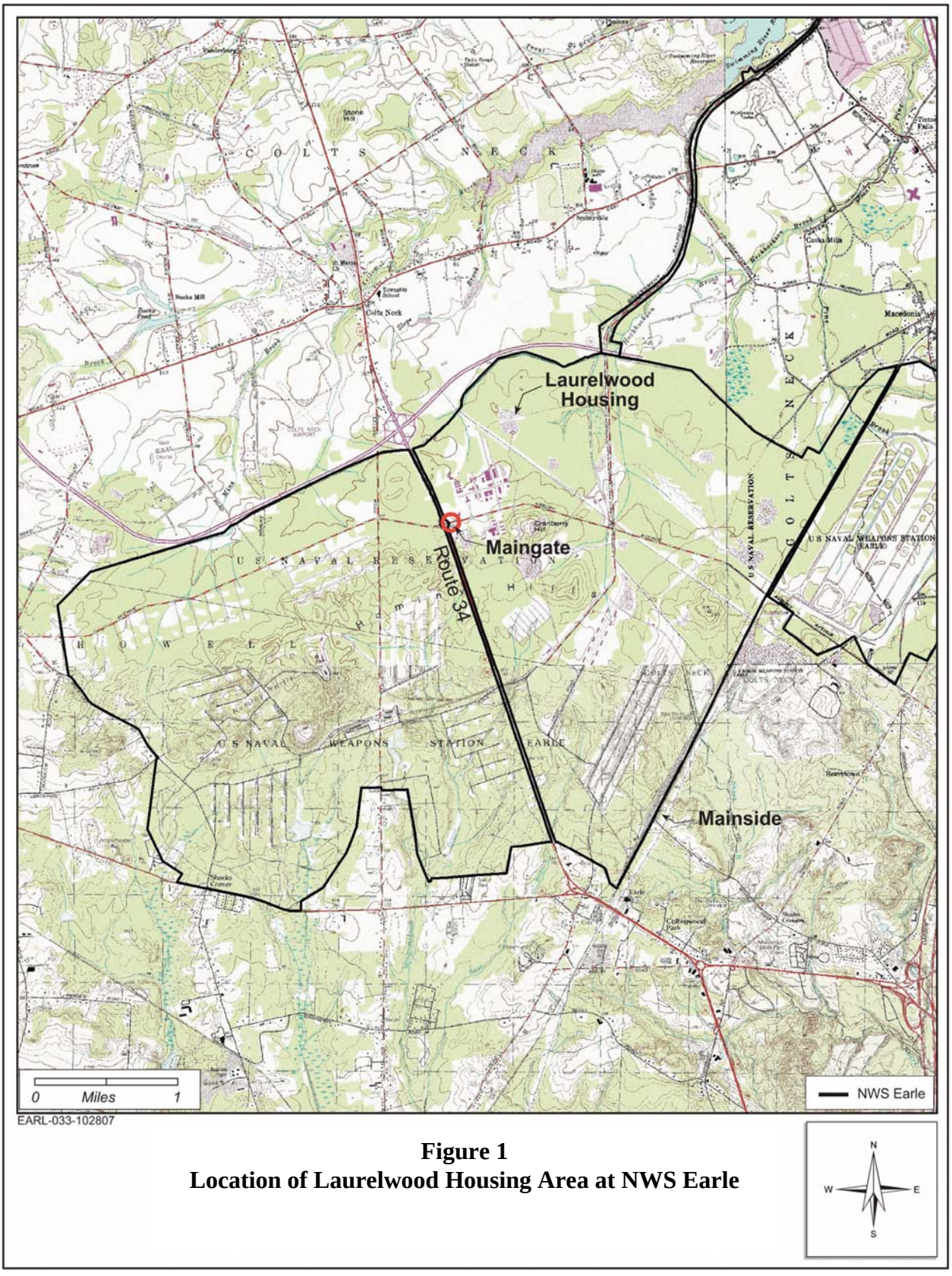
Copy to:

Ms. Deborah Fimbal, Historic Preservation Office, Trenton

Mr. Eric Helms, NWS Earle NJ

Ms. Cheryl Barnett, MIDLANT

Mr. Bruce Larson EV52



EARL-033-102807

Figure 1
Location of Laurelwood Housing Area at NWS Earle

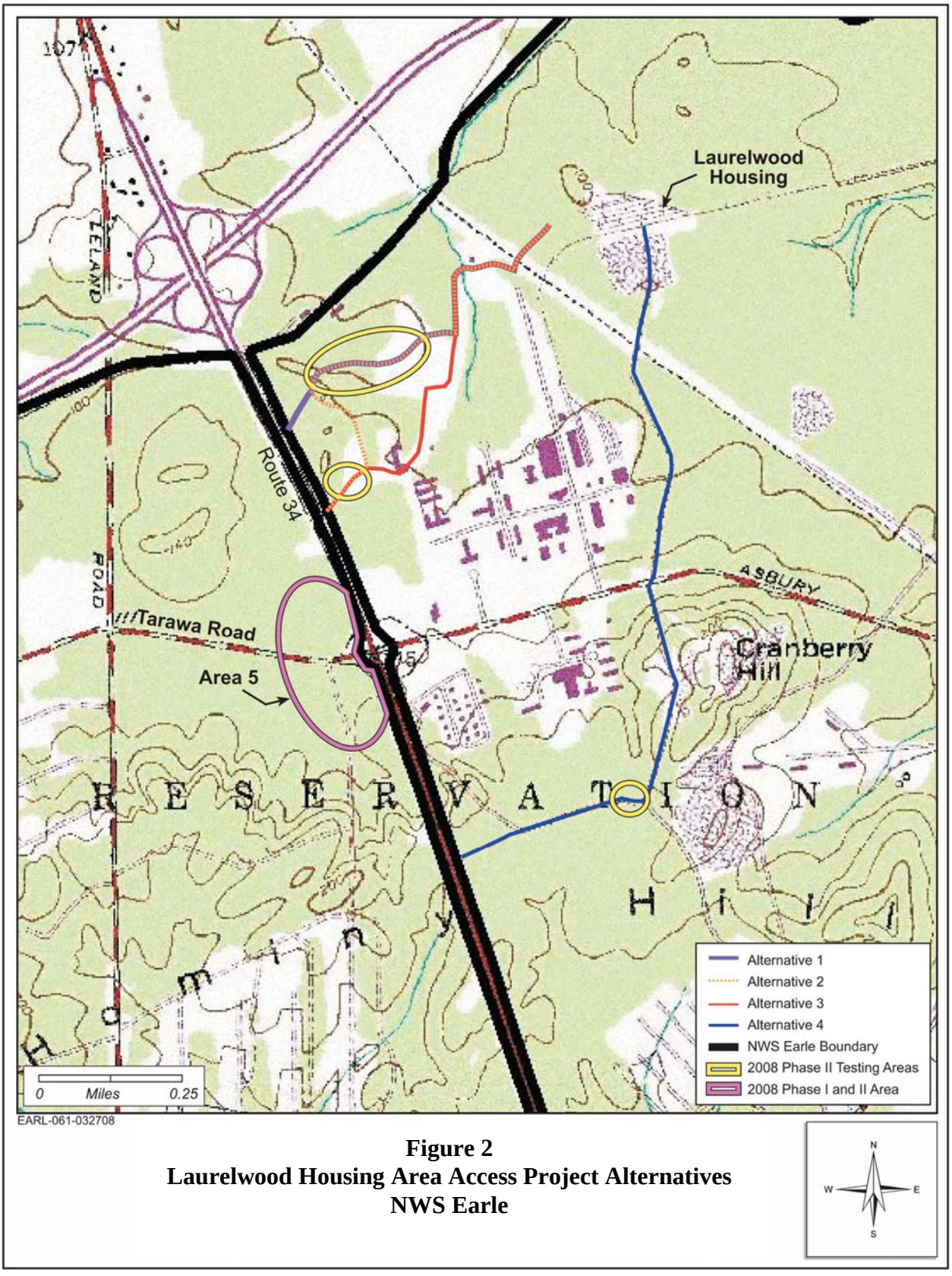


Figure 2
Laurelwood Housing Area Access Project Alternatives
NWS Earle



Figure 3
Historic Structures

State of New Jersey

James E. McGreevey
Governor

Department of Environmental Protection
Natural and Historic Resources, Historic Preservation Office
PO Box 404, Trenton, NJ 08625
TEL: (609) 292-2023 FAX: (609) 984-0578
www.state.nj.us/dep/hpo

Bradley M. Campbell
Commissioner

October 14, 2004
HPO-J2004-93
04-0264-2, -3 & -4

Tina A. Deininger, Historic Preservation Officer
Department of the Navy
Engineering Field Activity, Northeast
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop #82
Lester, PA 19113-2090

Dear Ms. Deininger:

In accordance with 36 CFR Part 800: Protection of Historic Properties, as published with amendments in the Federal Register on 6 July 2004 (69 FR 40544-40555), I am providing Consultation Comments for the following proposed undertaking:

Ocean County, Lakehurst Borough, Naval Air Engineering Station Lakehurst and
Monmouth County, Colts Neck, Naval Weapons Station Earle
Housing Privatization
Department of the Navy

800.4 Identification of Historic Properties

The Housing Units and improvements identified in Exhibits CR-6 and CR-7 (attached) have previously been listed, or identified as eligible for listing, on the National Register of Historic Places.

800.5 Applying the Criteria of Adverse Effect

Thank you for all your work to ensure that the housing privatization project will not have adverse effects. I concur with your letter of September 16,2004 as clarified by your e-mail of October 4, 2004 and the attached revised cultural resource lease language (copy attached). The proposed housing privatization project at Naval Weapon Station Earle and at Naval Air Engineering Station Lakehurst will have **no adverse effect** on historic properties.

Additional Comments

Please remember that Section 800.2(a)(1) requires that each federal agency ensure that all actions taken by employees or contractors of the agency meet the Secretary of the Interior's Minimum Professional Qualifications Standards.

Thank you again for having provided this opportunity for comment. If you have any questions, please contact Dan Saunders at (609) 633-2397, staff reviewer for this project

Sincerely,

Dorothy P. Guzzo
Deputy State Historic
Preservation Officer

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY, NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO

11010
Code EV33/TD
September 16, 2004

Ms. Dorothy Guzzo, Deputy State Historic Preservation Officer
Historic Preservation Office, Division of Parks and Forestry
P. O. Box 404
501 East State Street, 4th Floor
Trenton, New Jersey 08625-0404

Dear Ms. Guzzo:

SUBJECT: HOUSING PRIVATIZATION - NAVAL AIR ENGINEERING STATION (NAES) LAKEHURST, NEW JERSEY AND NAVAL WEAPONS STATION (NWS) EARLE, COLTS NECK NEW JERSEY

Thank you for your continued assistance with our National Historic Preservation Act compliance for subject project as well as for Mr. Dan Saunders' comments during our September 8, 2004 phone conversation. The current project boundary and scope (Project) will affect historic properties in the following way: historic buildings and structures (historic built environment) will be transferred and the underlying land will be leased to a Developer. As we have discussed before, the transferred improvements will revert back to the Government at the conclusion of the lease. The historic built environment is identified in the enclosed lease language as Exhibits CR-6 and 7.

Mr. Saunders' comments of September 8, 2004 have been incorporated as possible or as appropriate, or have been noted in the preparation of the enclosed lease language for the subject project.

The undertaking of the Housing Privatization at Naval Air Engineering Station Lakehurst, NJ and Naval Weapons Station Earle, NJ have been defined to include the enclosed lease language, accordingly, the Navy has determined that the undertaking will not have an adverse effect on historic properties in accordance with 36 CFR Part 800. We request your concurrence with this determination, also in accordance with 36 CFR Part 800.

11010
Code EV33/TD
September 16, 2004

Thank you in advance for your prompt response to this request for comment. If you have any questions, please contact the undersigned at (610) 595-0761.

Sincerely,

TINA A. DEININGER
Historic Preservation Officer
By direction of the
Commanding Officer

Enclosure: 1. Navy Northeast Housing Privatization Cultural Resource Lease Language of 15 September 2004

Electronic copy to: (w/encl):
NAES LAKEHURST, NJ (Attn: D. Blazak; E. Raaum)
NWS Earle, NJ (Attn: T. Gentile; D. Vassalo)
Navy Region Northeast (Attn: R. Conant)

Northeast Housing Privatization
Cultural Resource Lease Language
New Jersey Architectural

NOTE: The Agreements team will appropriately number the CR Exhibits when this language is inserted into the Housing PPV lease.

Exhibit [CR- 5 (NJ)]
Protection of Architectural Resources (and Historic Districts) in New Jersey

(1) Resource Identification. The Lessee recognizes that the Housing Units and improvements and Historic Districts at NWS Earle, Colts Neck and NJ, NAES Lakehurst, NJ, identified in Exhibits [CR-6 & CR-7], are eligible for inclusion on or listed on the National Register of Historic Places. (Collectively the "Historic Facilities" or individually a "Historic Facility" or "Historic District").

(2) Definitions

(a) Attributes shall mean:

i. Exterior features of the Historic Facilities, including, but not limited to, façade and fenestration, scale, color, materials and mass, views from, to, and across the Lease Premises, **AND/OR**

ii. Interior features and Historic District landscapes determined to be significant in consultation with State Historic Preservation Officer ("SHPO").

(b) Action shall mean: Construction, alteration, rehabilitation, remodeling, demolition, or other such action (including new construction in or modification of a non-contributing building in a Historic District) taken upon the Historic Facilities.

(c) Project Documentation. Shall mean the following, provided in writing:

i. Description of the Action;

ii. Determination of affect on the Historic Properties (as appropriate);

iii. Photographs showing before conditions and sketches/drawings showing before and after conditions; and

iv. Information on planned materials and methods.

(d) In Kind shall mean: Matching an original in design, including dimensions and profile, color, texture, other visual qualities and materials.

(e) Replacement in Kind shall mean: The replacement of a historic feature too deteriorated to repair with a new feature that matches the original in design, including dimensions and profile, color, texture, other visual qualities and materials.

(3) Lessee Staff Qualifications. All documents produced or submitted pursuant to this Exhibit shall be prepared by Lessee or its designee who meets or exceeds the

Secretary of the Interior's Professional Qualification Standards (48 FR 22716, September 1983).

(4) Maintenance.

(a) Lessee shall maintain, manage, and treat the Historic Facilities so as to protect their historic qualities in accordance with the following Secretary of the Interior's Standards (Secretary's Standards):

i. The *Secretary of the Interior's Standards for Rehabilitation* (36 CFR Part 67); and

ii. The *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 CFR Part 68); and

iii. The *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings.*

(b) Any Lessee supervisor of maintenance and/or repairs must be familiar with the Secretary's Standards.

(5) Project Concurrence. Except as provided in paragraph (6) below, the Lessee shall not undertake any Action or cause or permit any Action to be undertaken that would materially affect the integrity of or the appearance of the Historic Facility's Attributes or the Historic District's Attributes (whether the effect is within or outside the Lease Premises) without (a) prior submission of the Project Documentation for appropriate review and concurrence and (b) receipt of written concurrence with the Action by either the Government or the applicable SHPO.

(a) In the event that the Lessee determines that the Action will be undertaken in a manner consistent with the Secretary's Standards, the Lessee shall prepare Project Documentation and a written determination that such Action is consistent with the Secretary's Standards and complete ONE of the following two processes:

i. Submit the Project Documentation and the written determination to the Government for its concurrence. The Lessee shall provide to the applicable SHPO, for information purposes, a copy of the Project Documentation and the Government's written concurrence. **OR**

ii. Submit the Project Documentation and the written determination to the applicable SHPO for its written concurrence with a copy of such submission to the Government.

(6) The following types of Actions are specifically exempt from review and concurrence by the Government or SHPO. For purposes of this paragraph (6), the phrase "in-kind" is defined as using the same material, form and design or compatible substitute material if the form and design as well as the substitute material convey the same visual appearance of the existing feature:

(a) In-kind street, sidewalk, curbing and parking area resurfacing, and in-kind repair or replacement of site improvements including but not limited to fences, retaining walls and landscaping where no additional right-of-way is required within a Historic District.

(b) Modifications, not replacement unless specifically indicated, to interiors of Historic Facilities when no structural alteration is involved and when the visual character of the property shall not be effected such as:

i. Plumbing rehabilitation/replacement including but not limited to pipes and fixtures.
ii. HVAC system rehabilitation/replacement including but not limited to furnaces, pipes, ducts, radiators or other HVAC units.
iii. Electrical wiring: including but not limited to switches and receptacles.
iv. Interior surface treatments (floors, walls, ceilings, decorative plaster, woodwork): provided the work is limited to repainting, in-kind patching, refinishing, re-papering or replacing carpet, vinyl or tile floor materials.
v. Interior feature treatments including but not limited to doors, moldings, fireplaces and mantels provided the work is limited to in-kind repair, patching, repainting and refinishing.
vi. Insulation provided it is restricted to ceiling spaces and attic spaces.

(c) Minor, in-kind modifications to exteriors of Historic Facilities such as:

i. Caulking, weather-stripping, re-glazing, scraping and/or repainting.
ii. Flat or shallow pitch roof repair/replacement.
iii. Windows repair and/or replacement in-kind. In-kind is understood to mean new windows that duplicate the material, dimensions, design, detailing and operation of the historic windows. As well as: repair, scrape, repainting of existing windows; in-kind replacement of window sash, glass and hardware, including jamb tracks; and in-kind replacement of damaged and non-operable transoms.
iv. Storm windows and doors provided that they conform to the shape and size of the historic windows and doors.
v. In-kind repair/replacement of exterior features. The new features/items will duplicate the material, dimensions and detailing of the original. Features include: porches, railings, posts/columns, brackets, cornices, steps, flooring, and other decorative treatments; roofs; siding; exterior architectural details and features; cellar/bulkhead doors; doors; and gutters and downspouts.
vi. Masonry repair using material, mortar composition, color, joint profile and width that match the historic materials.

(f) Repairs, reconstruction, repainting or refinishing of damage caused by casualty loss, or vandalism as long as material and process used for such repair, reconstruction, repainting or refinishing are in-kind.

(g) Temporary installations of facilities to provide access to Historic Facilities by disabled persons provided these changes make no permanent modification to the Attributes.

(7) Project Review Timeframes.

(a) If the Government does not respond within twenty-one (21) calendar days to a Lessee request for concurrence with an Action after Government receipt of the related Project Documentation, the Lessee shall request such concurrence from the SHPO.

(b) If the SHPO does not respond to a Lessee request for concurrence with an Action within forty-five (45) calendar days after SHPO receipt of the related Project Documentation, the Lessee may proceed with the Action as described in the written documentation provided to the SHPO.

(8) Resolving Disagreements. If the SHPO does not concur with a particular Action, in whole or in part, as requested by the Lessee in paragraph (5) above, and the Lessee and SHPO are unable to resolve the matter, the Lessee shall provide the Government with written Notice of the Disagreement. Such notice shall include the following:

(a) A complete copy of the Lessee's letter to SHPO requesting SHPO concurrence; and

(b) A copy of the SHPO's written notice of the SHPO's non-concurrence; and

(c) A summary of unresolved issues with the Lessee's proposed solution; and

(d) A description of all steps taken to resolve the disagreement.

Upon receipt of the Notice of the Disagreement the Government shall use reasonable efforts to resolve the disagreement between the SHPO and Lessee.

(9) Emergency Actions.

(a) Applicability. This paragraph (9) shall only apply to Actions that will be accomplished within thirty (30) days after a catastrophic emergency where the appropriate Governmental Authority has declared a disaster or emergency ("Emergency Action"). The Lessee may request an extension to this thirty (30)-day period from the Government prior to the expiration of such Emergency Action period by providing the Government with a written explanation of the reason for the extension and the reasonable amount of days required to complete the Emergency Action. Immediate rescue and salvage operations conducted to preserve life or property are exempt from the Cultural Resource provisions set forth in this paragraph (9).

(b) Procedure. If an Emergency Action is required, the Lessee will provide written notice to the SHPO and any other interested parties previously identified by the Government or SHPO, as soon as practicable, of the need for the Emergency Action and a plan to address the Emergency Action (Emergency Notification). The SHPO shall have seven (7) calendar days from receipt of the Emergency Notification to comment on the Emergency Action. If the SHPO does not respond to such request, the Lessee may proceed with the Emergency Action.

(10) Lessee Reporting.

(a) The Lessee shall maintain a case file on each Historic Unit and related improvements. Such case file shall include all Project Documentation prepared pursuant to this Exhibit, all maintenance records for the Historic Properties and documentation of compliance with this Exhibit. Lessee shall provide all case files to the Government or related SHPO upon request. Upon the expiration of this Lease, Lessee shall deliver all such case files to the Government.

(11) Site Access. The Government and/or the SHPO shall be permitted access to the Historic Facilities at reasonable times and upon reasonable written notice to Lessee for the purpose of inspecting the Historic Facilities to determine whether there is compliance by Lessee with the Cultural Resource provisions of this Lease.

Exhibit [CR-6 (Earle)]

Historic Buildings, Structures and Districts
NWS Earle, Colts Neck, NJ

Naval Weapons Station Earle Quarters

A
B
C

See Earle map on following page.

APPENDIX E

LISTS OF FLORA AND FAUNA IN MONMOUTH COUNTY, NEW JERSEY

Common Name	Scientific Name
Ferns and Fern Allies	
ebony spleenwort	*Asplenium platyneuron*
northern lady fern	*Athyrium felix-femina v. angustum*
silvery glade fern	*Athyrium thelypterioides*
dissected grape fern	*Botrychium dissectum v. dissectum*
oblique grape fern	*Botrychium dissectum vs. obliquum*
rattlesnake fern	*Botrychium virginianum*
hay-scented fern	*Dennstaedtia punctilobula*
spinulose wood fern	*Dryopteris carthusiana*
Boott's fern	*Dryopteris cristata X intermedia*
crested fern	*Dryopteris critata*
intermediate wood fern	*Dryopteris intermedia*
marginal wood fern	*Dryopteris marginalis*
triploid wood fern	*Dryopteris X triploidia carthusiana X intermedia*
field horsetail	*Equisetum arvense*
crow's foot clubmoss	*Lycopodium digitatum*
tree clubmoss	*Lycopodium obscurum*
sensitive fern	*Onoclea sensibilis*
cinnamon fern	*Osmunda cinnamomea*
interrupted fern	*Osmunda claytoniana*
royal fern	*Osmunda regalis*
common polypody	*Polypodium virginianum*
Christmas fern	*Polystichum acrostichoides*
northern bracken	*Pteridium aquilinum v. latiusculum*
broad beech fern	*Thelypteris hexagonoptera*
New York fern	*Thelypteris noveboracensis*
Massachusetts fern	*Thelypteris simulata*
marsh fern	*Thelypteris thelypterioides*
netted chain fern	*Woodwardia areolata*
Virginia chain fern	*Woodwardia virginica*
Gymnosperms	
Atlantic white cedar	*Chamaecyparis thyoides*
common juniper	*Juniperus communis*
eastern red cedar	*Juniperus virginiana*
shortleaf pine	*Pinus echinata*
pitch pine	*Pinus rigida*
white pine	*Pinus strobus*
scrub pine	*Pinus virginiana*
American yew	*Taxus canadensis*
eastern hemlock	*Tsuga canadensis*
Dicotyledons, Excluding Woody Plants	
yarrow	*Achillea millefolium*
white baneberry	*Actaea pachypoda*
red baneberry	*Actaea rubra*
annual ragweed	*Ambrosia artemisiifolia*
great ragweed	*Ambrosia trifida*
western pearly everlasting	*Anaphalis margaritacea*
windflower	*Anemone quinquefolia*
groundnut	*Apios americana*
Indianhemp	*Apocynum cannabinum*

Common Name	Scientific Name
Dicotyledons, Excluding Woody Plants (cont'd)	
mouse-ear cress	*Arabidopsis thaliana*
lyre-leaved rock-cress	*Arabis lyrata*
common milkweed	*Asclepias syriaca*
butterfly weed	*Asclepias tuberosa*
large mouse-ear chickweed	*Cerastium vulgatum*
partridge pea	*Chamaecrista fasciculata*
celandine poppy	*Chelidonium majus*
chicory	*Cichorium intybus*
enchanter's nightshade	*Circaea lutetiana*
common bur thistle	*Cirsium lanceolatum*
great bindweed	*Convolvulus sepium*
jimson-weed	*Datura stramonium*
wild carrot	*Daucus carota*
Deptford pink	*Dianthus armeria*
beech drops	*Epifagus virginiana*
daisy fleabane	*Erigeron annuus*
Boneset	*Eupatorium perfoliatum*
white snake-root	*Eupatorium rugosum*
wild strawberry	*Fragaria virginiana*
cleavers	*Galium aparine*
rough bedstraw	*Galium asprellum*
Carolina cranesbill	*Geranium carolinianum*
wild geranium	*Geranium maculatum*
rough avens	*Geum virginianum*
Gill-over-the-ground	*Glecoma hederacea*
king devil	*Hieracium piloselloides*
rattlesnake weed	*Hieracium venosum*
spotted touch-me-not	*Impatiens capensis*
jewelweed	*Impatiens pallida*
round-headed bush clover	*Lespedeza capitata*
yellow toad-flax	*Linaria vulgaris*
Cardinal flower	*Lobelia cardinalis*
whorled loosestrife	*Lysimachia quadrifolia*
yellow sweet clover	*Melilotus officinalis*
horse mint	*Monarda punctata*
Indian pipe	*Monotropa uniflora*
northern evening primrose	*Oenothera biennis*
prickly pear	*Opuntia humifusa*
pale broom-rape	*Orobanche uniflora*
upright yellow wood-sorrel	*Oxalis stricta*
dwarf ginseng	*Panax trifolius*
garden phlox	*Phlox paniculata*
clammy ground cherry	*Physalis heterophylla*
smooth ground cherry	*Physalis longifolia*
pokeweed	*Phytolacca americana*
lance-leaved plantain	*Plantago lanceolata*
greater plantain	*Plantago major*
May apple	*Podophyllum peltatum*
Japanese knotweed	*Polygonum cuspidatum*
dotted smart weed	*Polygonum punctatum*

Common Name	Scientific Name
Dicotyledons, Excluding Woody Plants (cont'd)	
climbing false buckwheat	*Polygonum scandens*
Virginia knotweed	*Polygonum virginianum*
common cinquefoil	*Potentilla recta*
lion's foot	*Prenanthes serpentaria*
self-heal	*Prunella vulgaris*
meadow beauty	*Rhexia virginica*
sheep sorrel	*Rumex acetosella*
curled dock	*Rumex crispus*
bitter dock	*Rumex obtusifolius*
bloody dock	*Rumex sanguineus*
bouncing Bette	*Saponaria officinalis*
bladder campion	*Silene latifolia* ssp. *alba*
starry campion	*Silene stellata*
common chickweed	*Stellaria media*
Fall meadow-rue	*Thalictrum pubscens*
rabbit's foot clover	*Trifolium arvense*
red clover	*Trifolium pratense*
white clover	*Trifolium repens*
clasping Venus' looking-glass	*Triodanis perfoliata* var. *perfoliata*
moth mullein	*Verbascum blattaria*
great mullein	*Verbascum thapsus*
blue vervain	*Verbena hastata*
New York ironweed	*Vernonia noveboracensis*
periwinkle	*Vinca minor*
sweet white violet	*Viola blanda*
common purple violet	*Viola papilionacea*
primrose-leaved violet	*Viola primulifolia*
Canada cocklebur	*Xanthium strumarium* var. *canadense*
Trees, Shrubs, and Woody Vines	
boxelder	*Acer negundo*
Norway maple	*Acer platanoides*
sycamore maple	*Acer pseudo-platanus.*
red maple	*Acer rubrum*
silver maple	*Acer saccharinum*
horse-chestnut	*Aesculus hippocastanum*
tree-of-heaven	*Ailanthus altissima*
mimosa	*Albizia julibrissin*
smooth alder	*Alnus serrulata*
downy serviceberry	*Amelanchier arborea*
shadbush	*Amelanchier canadensis*
Coastal Plain serviceberry	*Amelanchier obovalis*
dwarf serviceberry	*Amelanchier stolonifera*
porcelain-berry	*Ampelopsis brevipedunculata*
Hercules' club	*Aralia spinosa*
bearberry	*Arctostaphylos uva-ursi*
red chokeberry	*Aronia arbutifolia*
black chokeberry	*Aronia melanocarpa*
hybrid chokecherry	*Aronia X prunifolia*
groundsel-tree	*Baccharis halimifolia*

Common Name	Scientific Name
Trees, Shrubs, and Woody Vines (cont'd)	
Japanese barberry	*Berberis thunbergii*
European barberry	*Berberis vulgaris*
yellow birch	*Betula alleghanensis*
sweet birch	*Betula lenta*
river birch	*Betula nigra*
gray birch	*Betula populifolia*
paper mulberry	*Broussonetia papyrifera*
trumpet-creeper	*Campsis radicans*
hornbeam	*Carpinus caroliniana*
bitternut-hickory	*Carya cordiformis*
pignut-hickory	*Carya glabra*
shagbark hickory	*Carya ovata*
mockernut-hickory	*Carya tomentosa*
chestnut	*Castanea dentata*
Southern catalpa	*Catalpa bignonioides*
Oriental bittersweet	*Celastrus orbiculata*
American bittersweet	*Celastrus scandens*
northern hackberry	*Celtis occidentalis*
buttonbush	*Cephalanthus occidentalis*
leatherleaf	*Chamaedaphne calyculata*
spotted wintergreen	*Chimaphila maculata*
Prince's pine	*Chimaphila umbellata*
purple clematis	*Clematis occidentalis*
yam-leaved clematis	*Clematis terniflora*
Virgin's bower	*Clematis virginiana*
Coast white alder	*Clethra alnifolia*
sweet fern	*Comptonia peregrina*
broom crowberry	*Corema conradii*
pagoda dogwood	*Cornus alternifolia*
knob-styled dogwood	*Cornus amomum*
flowering dogwood	*Cornus florida*
gray dogwood	*Cornus racemosa*
round-leaved dogwood	*Cornus rugosa*
red osier dogwood	*Cornus sericea*
American hazelnut	*Corylus americana*
cockspur-thorn	*Crataegus crus-galli*
frosted hawthorn	*Crataegus pruinosa*
fleshy hawthorn	*Crataegus succulenta*
persimmon	*Diospyros virginiana*
autumn olive	*Elaeagnus umbellata*
trailing arbutus	*Epigaea repens*
winged burning bush	*Euonymus alatus*
strawberry-bush	*Euonymus americana*
European spindle-tree	*Euonymus europaeus*
American beech	*Fagus grandifolia*
white ash	*Fraxinus americana*
black ash	*Fraxinus nigra*
ash	*Fraxinus pennsylvanica*
wintergreen	*Gaultheria procumbens*
black huckleberry	*Gaylussacia baccata*

Common Name	Scientific Name
Trees, Shrubs, and Woody Vines (cont'd)	
dwarf huckleberry	*Gaylussacia dumosa*
dangleberry	*Gaylussacia frondosa*
honey-locust	*Gleditsia triacanthos*
witch-hazel	*Hamamelis virginiana*
false heather	*Hudsonia ericoides*
false heather	*Hudsonia tomentosa*
St. Peter's wort	*Hypericum crux-andreae*
St. John's-wort	*Hypericum densiflorum*
St. Andrew's Cross	*Hypericum hypericoides*
inkberry	*Ilex glabra*
smooth winterberry	*Ilex laevigata*
American holly	*Ilex opaca*
winterberry	*Ilex verticillata*
maritime marsh-elder	*Iva frutescens*
butternut	*Juglans cinerea*
black walnut	*Juglans nigra*
sheep laurel	*Kalmia angustifolia*
mountain laurel	*Kalmia latifolia*
sand-myrtle	*Leiophyllum buxifolium*
swamp doghobble	*Leucothoe racemosa*
common privet	*Ligustrum vulgare*
northern spicebush	*Lindera benzoin*
sweetgum	*Liquidambar styraciflua*
tulip-tree	*Liriodendron tulipifera*
wild honeysuckle	*Lonicera dioica*
Japanese honeysuckle	*Lonicera japonica*
honeysuckle	*Lonicera morrowii*
male-berry	*Lyonia ligustrina*
staggerbush	*Lyonia mariana*
Osage orange	*Maclura pomifera*
cucumber-tree	*Magnolia acuminata*
umbrella-tree	*Magnolia tripetala*
sweet bay	*Magnolia virginiana*
cultivated apple	*Malus pumila*
apple	*Malus sylvestris*
moonseed	*Menispermum canadense*
partridge-berry	*Mitchella repens*
southern bayberry	*Morella caroliniensis*
wax-myrtle	*Morella cerifera*
white mulberry	*Morus alba*
red mulberry	*Morus rubra*
Northern bayberry	*Myrica pensylvanica*
black gum	*Nyssa sylvatica*
Virginia-creeper	*Parthenocissus quinquefolia*
grape-woodbine	*Parthenocissus vitacea*
white popular	*Populus alba*
balsam popular	*Populus balsamifera*
cottonwood	*Populus deltoides*
big-toothed aspen	*Populus grandidentata*
black popular	*Populus nigra*

Common Name	Scientific Name
Trees, Shrubs, and Woody Vines (cont'd)	
aspen	*Populus tremuloides*
wild plum	*Prunus americana*
sweet cherry	*Prunus avium*
sour cherry	*Prunus cerasus*
beach-plum	*Prunus maritima*
pin-cherry	*Prunus pensylvanica*
wild black cherry	*Prunus serotina*
choke-cherry	*Prunus virginiana*
domestic pear	*Pyrus communis*
white oak	*Quercus alba*
swamp white oak	*Quercus bicolor*
scarlet oak	*Quercus coccinea*
southern red oak	*Quercus falcata*
bear oak	*Quercus ilicifolia*
black-jack oak	*Quercus marilandica*
pin-oak	*Quercus palustris*
willow oak	*Quercus phellos*
rock chestnut	*Quercus prinus*
northern red oak	*Quercus rubra*
black oak	*Quercus velutina*
pink azalea	*Rhododendron periclymenoides*
rosebud azalea	*Rhododendron prinophyllum*
swamp azalea	*Rhododendron viscosum*
shining sumac	*Rhus copallinum*
smooth sumac	*Rhus glabra*
staghorn sumac	*Rhus typhina*
northern gooseberry	*Ribes hirtellum*
Appalachian gooseberry	*Ribes rotundifolium*
cultivated currant	*Ribes rubrum*
black locust	*Robinia pseudo-acacia*
smooth rose	*Rosa blanda*
pasture rose	*Rosa carolina*
sweetbriar rose	*Rosa eglanteria*
multiflora rose	*Rosa multiflora*
Japanese rose	*Rosa rugosa*
Virginia rose	*Rosa virginiana*
common blackberry	*Rubus allegheniensis*
Southern dewberry	*Rubus enslenii*
northern dewberry	*Rubus flagellaris*
swamp dewberry	*Rubus hispidus*
black raspberry	*Rubus occidentalis*
Pennsylvania blackberry	*Rubus pensilvanicus*
wine raspberry	*Rubus phoenicolasius*
dwarf raspberry	*Rubus pubescens*
weeping willow	*Salix babylonica*
beaked willow	*Salix bebbiana*
pussy willow	*Salix discolor*
sandbar willow	*Salix exigua*
upland willow	*Salix humilis*
shining willow	*Salix lucida*

Common Name	Scientific Name
Trees, Shrubs, and Woody Vines (cont'd)	
black willow	*Salix nigra*
upland willow	*Salix occidentalis*
silky willow	*Salix sericea*
common elder	*Sambucus canadensis*
sassafras	*Sassafras albidum*
greenbriar	*Smilax glauca*
greenbriar	*Smilax laurifolia*
greenbriar	*Smilax rotundifolia*
bittersweet	*Solanum dulcamara*
meadowsweet	*Spiraea alba* var. *latifolia*
spirea	*Spiraea prunifolia*
hardhack	*Spiraea tomentosa*
bladder-nut	*Staphylea trifolia*
snowberry	*Symphoricarpos albus*
coralberry	*Symphoricarpos orbiculatus*
basswood	*Tilia americana*
poison oak	*Toxicodendron pubescens*
common poison ivy	*Toxicodendron radicans*
poison sumac	*Toxicodendron vernix*
American elm	*Ulmus americana*
red elm	*Ulmus rubra*
common low-bush blueberry	*Vaccinium angustifolium*
highbush blueberry	*Vaccinium corymbosum*
cranberry	*Vaccinium macrocarpon*
small cranberry	*Vaccinium oxycoccos*
hillside blueberry	*Vaccinium pallidum*
deerberry	*Vaccinium stamineum*
dockmackie	*Viburnum acerifolium*
arrow-wood	*Viburnum dentatum*
sheepberry	*Viburnum lentago*
black haw	*Viburnum prunifolium*
summer grape	*Vitis aestivalis* var. *bicolor*
fox-grape	*Vitis labrusca*
frost-grape	*Vitis riparia*
Chinese wisteria	*Wisteria sinensis*
Adam's needle	*Yucca filamentosa*
common prickly ash	*Zanthoxylum americanum*
Monocotyledons, Excluding Grasses & Grass-like Plants	
wild garlic	*Allium vineale*
Jack-in-the-pulpit	*Arisaema triphyllum*
asparagus	*Asparagus officinalis*
creeping dayflower	*Commelina nudiflora*
stemless ladies' -slipper	*Cypripedium acaule*
trout lily	*Erythronium americanum*
downy rattlesnake plantain	*Goodyera pubescens*
day lily	*Hemerocallis fulva*
Turk's-cap lily	*Lilium superbum*
tiger lily	*Lilium tigrinum*
Canada mayflower	*Maianthemum canadense*

Common Name	Scientific Name
Monocotyledons, Excluding Grasses & Grass-like Plants (cont'd)	
Indian cucumber-root	*Medeola virginiana*
Star-of-Bethlehem	*Ornithogalum umbellatum*
Solomon's Seal	*Polygonatum biflorum*
false Solomon's Seal	*Smilancina racemosa*
little ladies'-tresses	*Spiranthes tuberosa*
skunk cabbage	*Symplocarpus foetidus*
spiderwort	*Tradescantia virginiana*
perfoliate bellwort	*Uvularia perfoliata*
sessile-leaved bellwort	*Uvularia sessilifolia*

Source: Brooklyn Botanical Garden 2000; Colts Neck Environmental Commission 1983, as cited in U.S. Navy 2001.

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Herons & Bitterns ***Ardeidae***		
Great Blue Heron*	*Ardea herodias*	CY
American Bittern	*Botaurus lentiginosus*	UY
Cattle Egret	*Bubulcus ibis*	UT
Green Heron*	*Butorides virescens*	CS
Little Blue Heron	*Egretta caerulea*	CT
Common Egret	*Egretta garzetta*	CS
Snowy Egret	*Egretta thula*	CS
Black Crown Night Heron	*Nycticorax nycticorax*	CY
Blackbirds ***Icteridae***		
Red-winged Blackbird*	*Agelaius phoeniceus*	AY
Bobolink	*Dolichonyx oryzivorus*	UT
Rusty Blackbird	*Euphagus carolinus*	CW
Baltimore Oriole	*Icterus galbula galbula*	CS
Orchard Oriole*	*Icterus spurius*	OS
Brown-headed Cowbird*	*Molothrus ater*	AY
Boat-tailed Grackle	*Quiscalus major*	RT
Common Grackle*	*Quiscalus quiscula*	AY
Eastern Meadowlark*	*Sturnella magna*	CY
Thrushes ***Turdidae***		
Veery*	*Catharus fuscescens*	CT
Hermit Thrush	*Catharus guttatus*	CT
Gray-cheeked Thrush	*Catharus minimus*	CS
Swainson's Thrush	*Catharus ustulatus*	CT
Wood Thrush*	*Hyiocichla mustelina*	CS
Eastern Bluebird*	*Sialia sialis*	US
Robin*	*Turdus migratorius*	AY
New World Quail ***Odontophoridae***		
Bobwhite*	*Colinus virginianus*	CY
Cardinals ***Cardinalidae***		
Cardinal*	*Cardinalis cardinalis*	AY
Indigo Bunting*	*Passerina cyanea*	CS
Rose-breasted Grosbeak*	*Pheucticus ludovicianus*	CT

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Mockingbirds & Thrashers ***Mimidae***		
Catbird*	*Dumetella carolinensis*	AS
Mockingbird*	*Mimus polyglottos*	CY
Brown Thrasher*	*Toxostoma rufum*	CS
Wood Warblers ***Parulidae***		
Bay-breasted Warbler	*Dendroica castanea*	CT
Cerulean Warbler	*Dendroica cerulea*	OT
Yellow-rumped Warbler	*Dendroica coronata*	AW
Prairie Warbler*	*Dendroica discolor*	CS
Yellow-throated Warbler	*Dendroica dominica*	RT
Blackburnian Warbler	*Dendroica fusca*	CT
Magnolia Warbler	*Dendroica magnolia*	CT
Palm Warbler	*Dendroica palmarum*	CT
Chestnut-sided Warbler*	*Dendroica pensylvanica*	CT
Yellow Warbler*	*Dendroica petechia*	CS
Pine Warbler*	*Dendroica pinus*	CS
Blackpoll Warbler	*Dendroica striata*	CT
Cape May Warbler	*Dendroica tigrina*	CT
Black-throated Green Warbler	*Dendroica virens*	CT
Yellow-breasted Chat	*Icteria virens*	US
Black and White Warbler*	*Mniotilta varia*	CS
Northern Parula Warbler	*Parula americana*	CT
Prothonotary Warbler	*Protonotaria citrea*	UT
Ovenbird*	*Seiurus aurocapillus*	CS
Louisiana Waterthrush	*Seiurus motacilla*	CT
Northern Waterthrush	*Seiurus noveboracensis*	CT
American Redstart	*Setophaga ruticilla*	CS
Tennessee Warbler	*Vermivora peregrina*	CT
Blue Winged Warbler*	*Vermivora pinus*	CS
Nashville Warbler	*Vermivora rudicapilla*	CT
Canada Warbler*	*Wilsonia canadensis*	CT
Hooded Warbler*	*Wilsonia citrina*	US
Wilson's Warbler	*Wilsonia pusilla*	CT
Chickadees & Titmice ***Paridae***		
Tufted Titmouse*	*Baeolophus bicolor*	CY
Black-capped Chickadee	*Poecile atricapillus*	UW
Carolina Chickadee*	*Poecile carolinensis*	AY

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Rails, Gallinules, & Coots ***Rallidae***		
American Coot	*Fulica americana*	AW
Common Moorhen	*Gallinula chloropus*	CT
Cormorants ***Phalacrocoracidae***		
Double-crested Cormorant*	*Phalacrocorax auritus*	CW
Great Cormorant	*Phalacrocorax carbo*	CW
Creepers ***Certhiidae***		
Brown Creeper	*Certhia americana*	CW
Finches ***Fringillidae***		
Common Redpoll	*Carduelis flammea*	OW
Pine Siskin	*Carduelis pinus*	UW
American Goldfinch*	*Carduelis tristis*	AY
House Finch*	*Carpodacus mexicanus*	CY
Purple Finch	*Carpodacus purpureus*	CW
Evening Grosbeak	*Coccothraustes vespertinus*	CW
Red Crossbill	*Loxia curvirostra*	OW
Crows & Jays ***Corvidae***		
Common Crow*	*Corvus brachyrhynchos*	AY
Fish Crow*	*Corvus ossifragus*	CS
Blue Jay*	*Cyanocitta cristata*	AY
Cuckoos, Roadrunners, & Anis ***Cuculidae***		
Yellow-billed Cuckoo*	*Coccyzus americanus*	CS
Black-billed Cuckoo*	*Coccyzus erthropthalmus*	CS
Pigeons & Doves ***Columbidae***		
Mourning Dove*	*Zenaida macroura*	AY
Sandpipers & Phalaropes ***Scolopacidae***		
Spotted Sandpiper	*Actitis macularia*	CS
Sanderling	*Calidris alba*	AW
Pectoral Sandpiper	*Calidris melanotos*	CT
Least Sandpiper	*Calidris minutilla*	CT
Semi-palmated Sandpiper	*Calidris pusilla*	AT
Common Snipe	*Gallinago gallinago*	CT

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Sandpipers & Phalaropes (cont'd) ***Scolopacidae***		
Short-billed Dowitcher	*Limnodromus griseus*	CT
American Woodcock*	*Scolopax minor*	CS
Greater Yellowlegs	*Tringa melanoleuca*	AT
Solitary Sandpiper	*Tringa solitaria*	CT
Ducks, Geese, & Swans ***Anatidae***		
Dabbling Ducks		
Northern Pintail	*Anas acuta*	CW
Green-winged Teal	*Anas crecca*	CW
Blue-winged Teal	*Anas discors*	CS
Mallard*	*Anas platyrhynchos*	AY
American Black Duck	*Anas rubripes*	AY
Gadwall	*Anas strepera*	CW
Mergansers		
Hooded Merganser	*Lophodytes cucullatus*	UW
Common Merganser	*Mergus merganser*	CW
Red-breasted Merganser	*Mergus serrator*	CW
Perching Ducks		
Wood Duck*	*Aix sponsa*	CS
Pochards Ducks		
Lesser Scaup Duck	*Aytha affinis*	AW
Greater Scaup Duck	*Aytha marila*	AW
Redhead Duck	*Aythya americana*	UW
Ring-necked Duck	*Aythya collaris*	CW
Canvasback	*Aythya valisineria*	AW
Sea Ducks		
Bufflehead	*Bucephala albeola*	CW
Common Goldeneye Duck	*Bucephala clangula*	CW
Oldsquaw	*Clangula hyemalis*	CW
Harlequin Duck	*Histrionicus histrionicus*	OW
White-winged Scoter	*Melanitta fusca*	CW
Stiff-tailed Ducks		
Ruddy Duck	*Oxyura jamaicensis*	CW
Geese		
Brant Goose	*Branta bernicla*	CW
Canada Goose*	*Branta canadensis*	CW
Snow Goose	*Chen caerulescens*	UW
Swans		
Mute Swan	*Cygnus olor*	CS

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Woodpeckers ***Picidae***		
Yellow-shafted Flicker*	*Colaptes auratus*	CY
Downy Woodpecker*	*Picoides pubescens*	CY
Hairy Woodpecker*	*Picoides villosus*	CY
Yellow-bellied Sapsucker	*Sphyrapicus varius*	CT
Tyrant Flycatchers ***Tyrannidae***		
Eastern Wood Pewee*	*Contopus virens*	CS
Least Flycatcher*	*Empidonax minimus*	CS
Great Crested Flycatcher*	*Myiachus crinitus*	CS
Eastern Phoebe*	*Sayornis phoebe*	CS
Eastern Kingbird*	*Tyrannus tyrannus*	CS
Old World Warblers & Gnatcatchers ***Sylviidae***		
Blue-gray Gnatcatcher*	*Polioptila caerula*	CS
Grebes ***Podicipedidae***		
Horned Grebe	*Podiceps auritus*	CW
Red-necked Grebe	*Podiceps grisegena*	UW
Pied-billed Grebe	*Podilymbus podiceps*	CW
Partridges, Grouses, & Turkeys ***Phasianidae***		
Ruffed Grouse	*Bonasa umbellus*	UY
Ringed-necked Pheasant	*Phasianus colchicus*	CY
Skuas, Gulls, Terns, & Skimmers ***Laridae***		
Black Tern	*Childonias nige*	CT
Herring Gull*	*Larus argentatus*	AY
Laughing Gull	*Larus atricilla*	AS
Ring-billed Gull	*Larus delawarensis*	CW
Lesser Black-backed Gull	*Larus fuscus*	RT
Great Black-backed Gull	*Larus marinus*	AY
Bonaparte's Gull	*Larus philadelphia*	AW
Least Tern	*Sterna antillarum*	CS
Forster's Tern	*Sterna forsteri*	CY
Common Tern	*Sterna hirundo*	AS
Royal Tern	*Sterna maxima*	CT

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Hawks, Kites, & Eagles ***Accipitridae***		
Cooper's Hawk*	*Accipiter cooperii*	UY
Sharp-shinned Hawk	*Accipiter striatus*	UY
Red-tailed Hawk*	*Buteo jamaicensis*	CY
Broad-winged Hawk*	*Buteo platypterus*	CS
Osprey	*Pandion haliaetus*	CS
Nighthawks & Nightjars ***Caprimulgidae***		
Whip-poor-will*	*Caprimulgus vociferus*	CS
Nighthawk	*Chordeiles minor*	US
Hummingbirds ***Trochilidae***		
Ruby-throated Hummingbird*	*Archilochus colubris*	CS
Emberizids ***Emberizidae***		
Seaside Sparrow	*Ammodramas maritimus*	CS
Saltmarsh Sharptailed Sparrow	*Ammodramus caudacutus*	CS
Henslow's Sparrow	*Ammodramus henslowii*	US
Grasshopper Sparrow	*Ammodramus savannarum*	CS
Lark Sparrow	*Calamospiza melanocorys*	OW
Lapland Longspur	*Calcarius lapponicus*	OW
Slate-colored Junco	*Junco hyemalis hyemalis*	AW
Oregon Junco	*Junco hyemalis thurberi*	OW
Swamp Sparrow	*Melospiza geogiana*	CY
Song Sparrow*	*Melospiza melodia*	AY
Savannah Sparrow	*Passerculus sandwichensis*	CW
Fox Sparrow	*Passerella iliaca*	CW
Eastern Towhee	*Pipilo erythrophthalmus*	AS
Vesper Sparrow	*Pooecetes gramineus*	US
Clay-colored Sparrow	*Spizella pallida*	OT
Field Sparrow*	*Spizella pusilla*	CY
White-throated Sparrow	*Zonotrichia albicollis*	AW
Lapwings & Plovers ***Charadriidae***		
Semi-palmated Plover	*Charadrius semipalmatus*	CT
Killdeer*	*Charadrius vociferus*	CY
Kingfishers ***Alcedinidae***		
Belted Kingfisher*	*Ceryle alcyon*	CY

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Kinglets ***Regulidae***		
Ruby-crowned Kinglet	*Regulus calendula*	CT
Golden-crowned Kinglet	*Regulus satrapa*	AW
Larks ***Alaudidae***		
Horned Lark	*Eremophila alpestris*	CY
Loons ***Gaviidae***		
Common Loon	*Gavia immer*	CW
Red-throated Loon	*Gavia stellata*	CW
Swallows ***Hirundinidae***		
Purple Martin*	*Progne subis*	CS
Northern Rough-winged Swallow*	*Stelgidopteryx serripennis*	CS
Tree Swallow*	*Tachycineta bicolor*	AS
Nuthatches ***Sittidae***		
White-breasted Nuthatch*	*Sitta carolinensis*	CY
Owls ***Tytonidae & Strigidae***		
Northern Saw-whet Owl*	*Aegolius acadicus*	UW
Great Horned Owl*	*Bubo virginianus*	CY
Eastern Screech Owl*	*Otus asio*	CY
Barn Owl	*Tyto alba*	UY
Shrike ***Laniidae***		
Loggerhead Shrike	*Lanius ludovicianus*	OW
Old World Sparrows ***Passeridae***		
House Sparrow*	*Passer domesticus*	AY
Starlings ***Sturnidae***		
Barn Swallow*	*Hirundo rustica*	AS
Bank Swallow*	*Riparia riparia*	US
European Starling*	*Sturnus vulgaris*	AY
Swifts ***Apodidae***		
Chimney Swift*	*Chaetura pelagica*	AS

Common Name[1]	Scientific Name	Abundance & Seasonality[2]
Tanagers ***Thraupidae***		
Scarlet Tanager*	*Piranga olivacea*	CS
Vireos ***Vireonidae***		
Yellow-throated Vireo*	*Vireo flavifrons*	CS
White-eyed Vireo*	*Vireo griseus*	CS
Red-eyed Vireo*	*Vireo olivaceus*	AS
Blue-headed Vireo	*Vireo solitarius*	CT
New World Vultures ***Cathartidae***		
Turkey Vulture*	*Cathartes aura*	CS
Waxwings ***Bombycillidae***		
Cedar Waxwing*	*Bombycilla cedrorum*	CY
Wrens ***Troglodytidae***		
Marsh Wren	*Cistothorus palustris*	CS
Carolina Wren*	*Thryothorus ludovicianus*	CY
House Wren*	*Troglodytes aedon*	CS

[1]* indicates that these species have been observed on NWS Earle.

[2]A = abundant (everyday birds); C = common (may be tallied in habitat in all seasons); U = uncommon (infrequent but not rare); O = occasional (near rare); R = rare; Y = year round; S = summer; W = winter; T = transient.

Source: New Jersey Department of Environmental Protection 2000; D. Sutherland 1995 as cited in U.S. Navy 2001

Common Name	Scientific Name
Mammals	
Bats: Chiroptera	
Big Brown Bat	*Eptesicus fuscus*
Silver-haired Bat	*Lasionycteris noctivagans*
Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Northern Yellow Bat	*Lasiurus intermedius*
Small-footed Myotis	*Myotis leibii*
Little Brown Bat	*Myotis lucifugus*
Keen's Myotis	*Myotis septentrionalis*
Indiana Bat	*Myotis sodalis*
Eastern Pipistrel	*Pipistrellus sunflavus*
Insect-Eating Mammals: Insectivora	
Short-tailed Shrew	*Blarina brevicauda*
Star-nosed Mole	*Condylura cristata*
Least Shrew	*Crytotis parva*
Masked Shrew	*Sorex cinereus*
Tuckahoe Masked Shrew	*Sorex cinereus nigriculus*
Smokey Shrew	*Sorex fumeus*
Pygmy Shrew	*Sorex hoyii*
Water Shrew	*Sorex palustris*
Gnawing Mammals: Rodentia	
Beaver	*Castor canadensis*
Boreal Redback Vole	*Clethrionomys gapperi*
Porcupine	*Erethizon dorsatum*
Northern Flying Squirrel	*Glaucomys sabrinus*
Southern Flying Squirrel	*Glaucomys volans*
Woodchuck	*Marmota monax*
Meadow Vole	*Microtus pennsylvanicus*
Pine Vole	*Microtus pinetorum*
House Mouse	*Mus musculus*
Nutria	*Myocastor coypus*
Woodland Jumping Mouse	*Napaeozapus insignis*
Eastern Wood Rat	*Neotoma floridana*
Muskrat	*Ondatra zibethica*
Marsh Rice Rat	*Oryzomys palustris*
Hairy-tailed Mole	*Parascalops breweri*
White-footed Mouse	*Peromyscus leucopus*
Brown or Norway Rat	*Rattus norvegicus*
Black Rat	*Rattus rattus*
Eastern Mole	*Scalopus aquaticus*
Eastern Gray Squirrel	*Sciutus carolinensis*
Southern Bog Lemming	*Synaptomys cooperi*
Eastern Chipmunk	*Tamias striatus*
Red Squirrel	*Tamiasciurus hudsonicus*
Meadow Jumping Mouse	*Zapus hudsonius*

Appendix C. Non-Avian Vertebrates of Monmouth County (cont'd).

Common Name	Scientific Name
Pikas, Hares, & Rabbits: Lagomorpha	
Black-tailed Jackrabbit	*Lepus californicus*
European Hare	*Lepus capensis*
White-tailed Jackrabbit	*Lepus townsendii*
Eastern Cottontail Rabbit	*Sylvilagus floridanus*
New England Cottontail Rabbit	*Sylvilagus transitionalis*
Pouched Mammals: Marsupialia	
Opossum	*Didelphis marsupialis*
Even-toed Hoofed Mammals: Artiodactyla	
Virginia White-tailed Deer	*Odocoileus virginianus*
Flesh-eaters: Carnivora	
Eastern Coyote	*Canis latrans*
Bobcat	*Felis rufus*
River Otter	*Lutra canadensis*
Striped Skunk	*Mephitis mephitis*
Ermine	*Mustela erminea*
Longtail Weasel	*Mustela frenata*
Mink	*Mustela vison*
Raccoon	*Procyon lotor*
Gray Fox	*Urocyon cinereoargenteus*
Black Bear	*Ursus americanus*
Red Fox	*Vulpes vulpes*
Marine Mammals	
Seals	
Hooded Seal	*Cystophora cristata*
Gray Seal	*Halichoerus grypus*
Harp Seal	*Pagophilus groenlandica*
Harbor Seal	*Phoca vitulina*
Dolphins & Porpoises	
Saddle-backed Dolphin	*Delphinus delphis*
Risso's Dolphin	*Grampus griseus*
Harbor Porpoise	*Phocoena phocoena*
Striped Dolphin	*Stenella coeruleoalba*
Brindled Spotted Dolphin	*Stenella frontalis*
Spotted Dolphin	*Stenella plagiodon*
Bottle-nosed Dolphin	*Tursiops trincatus*
Whales	
Black Right Whale	*Balaena glacialis*
Minke Whale	*Balaenoptera acutorostrata*
Sei Whale	*Balaenoptera borealis*
Blue Whale	*Balaenoptera musculus*
Fin Whale	*Balaenoptera physalus*
Beluga Whale	*Delphinapterus leucas*
Short-finned Pilot Whale	*Globicephala macrorhyncus*
Long-finned Pilot Whale	*Globicephala melaena*

Appendix C. Non-Avian Vertebrates of Monmouth County (cont'd).

Common Name	Scientific Name
Whales (cont'd)	
Pygmy Sperm Whale	*Kogia breviceps*
Dwarf Sperm Whale	*Kogia simus*
Humpback Whale	*Megaptera novaeangliae*
Dense-beaked Whale	*Mesoplodon densirostris*
Gervais Beaked Whale	*Mesoplodon europaeus*
True's Beaked Whale	*Mesoplodon mirus*
Atlantic Killer Whale	*Orcinus orca*
Sperm Whale	*Physeter macrocephalus*
Goose-beaked Whale	*Ziphius cavirostris*
Reptiles	
Lizards	
Five-lined Skink	*Eumeces fasciatus*
Northern Fence Lizard	*Sceloporus undulatus hyacinthinus*
Ground Skink	*Scincella lateralis*
Freshwater & Terrestrial Turtles	
Common Snapping Turtle	*Chelydra serpentina serpentina*
Midland Painted Turtle	*Chrysemys picta marginata*
Eastern Painted Turtle	*Chrysemys picta picta*
Spotted Turtle	*Clemmys guttata*
Wood Turtle	*Clemmys insculpta*
Bog Turtle	*Clemmys muhlenbergi*
Map Turtle	*Graptemys geographica*
Eastern Mud Turtle	*Kinosternon subrubrum subrubrum*
Northern Diamond-backed Terrapin	*Malaclemys terrapin terrapin*
Red-bellied Turtle	*Pseudemys rubriventirs*
Red-earred Turtle	*Pseudemys scripta elegans*
Stinkpot (Musk Turtle)	*Sternotherus odoratus*
Eastern Box Turtle	*Terrapene carolina carolina*
Eastern Spiny Softshell	*Trionyx spiniferus*
Marine Turtles	
Atlantic Loggerhead Turtle	*Caretta caretta*
Atlantic Green Turtle	*Chelonia mydas*
Atlantic Leatherback	*Dermochelys coriacea*
Atlantic Hawksbill Turtle	*Eremochelys imbricata*
Atlantic Ridley	*Lepidochelys kempi*
Snakes	
Northern Copperhead	*Agkistrodon contortrix mokasen*
Eastern Worm Snake	*Carphophis amoenus amoenus*
Northern Scarlet Snake	*Cemophora coccinea copei*
Northern Black Racer	*Coluber constrictor constrictor*
Timber Rattlesnake	*Crotalus horridus horridus*
Northern Ringneck Snake	*Diadophis punctatus edwardsi*
Southern Ringneck Snake	*Diadophis punctatus punctatus*
Corn Snake	*Elaphe guttata guttata*

Appendix C. Non-Avian Vertebrates of Monmouth County (cont'd).

Common Name	Scientific Name
Snakes (cont'd)	
Black Rat Snake	*Elaphe obsoleta obsoleta*
Eastern Hognose Snake	*Heterodon platyrhinos*
Eastern King Snake	*Lampropeltis getulus getulus*
Eastern Milk Snake	*Lampropeltis triangulum triangulum*
Northern Water Snake	*Nerodia sipedon*
Rough Green Snake	*Opheodrys aestivus*
Eastern Smooth Green Snake	*Opheodrys vernalis vernalis*
Northern Pine Snake	*Pituophis melanoleucus melanoleucus*
Queen Snake	*Regina septemvittata*
Northern Brown Snake	*Storeria dekayi dekayi*
Northern Red-bellied Snake	*Storeria occipitomaculata occipitomaculata*
Eastern Garter Snake	*Thamnophic sirtalis sirtalis*
Eastern Ribbon Snake	*Thamnophis sauritus sauritus*
Eastern Smooth Earth Snake	*Virginia valeriae valeriae*
Amphibians	
Salamanders & Newts	
Jefferson Salamander	*Ambystoma jeffersonianum*
Blue-spotted Salamander	*Ambystoma laterale*
Spotted Salamander	*Ambystoma maculatum*
Marbled Salamander	*Ambystoma opacum*
Silvery Salamander	*Ambystoma platineum*
Eastern Tiger Salamander	*Ambystoma tigrinum trigrinum*
Tremblay's Salamander	*Ambystoma tremblayi*
Northern Dusky Salamander	*Desmognathus fuscus*
Mountain Dusky Salamander	*Desmognathus ochrophaeus*
Northern Two-lined Salamander	*Eurycea bislineata bislineata*
Long-tailed Salamander	*Eurycea longicauda longicauda*
Northern Spring Salamander	*Gyrinophilus porphyriticus porphyriticus*
Four-toed Salamander	*Hemidactylium scutatum*
Red-spotted Newt	*Notophthalmus viridescens viridescens*
Red-backed Salamander	*Plethodon cinereus cinereus*
Slimy Salamander	*Plethodon glutinosus glutinosus*
Eastern Mud Salamander	*Pseudotriton montanus montanus*
Northern Red Salamander	*Pseudotriton ruber ruber*
Toads	
American Toad	*Bufo americanus*
Fowler's Toad	*Bufo woodhousii fowleri*
Eastern Spadefoot Toad	*Scaphiopus holbrookii holbrookii*
Tree Frogs	
Northern Cricket Frog	*Acris crepitans crepitans*
Pine Barrens Tree Frog	*Hyla andersonii*
Southern Gray Tree Frog	*Hyla chrysoscelis*
Northern Spring Peeper Frog	*Hyla crucifer crucifer*
Barking Tree Frog	*Hyla gratiosa*
Northern Gray Tree Frog	*Hyla versicolor*

Appendix C. Non-Avian Vertebrates of Monmouth County (cont'd).

Common Name	Scientific Name
Tree Frogs (cont'd)	
Upland Chorus Frog	*Pseudacris triseriata feriarum*
New Jersey Chorus Frog	*Pseudacris triseriata kalmi*
True Frogs	
Bull Frog	*Rana catesbeiana*
Green Frog	*Rana clamitans melanota*
Pickerel Frog	*Rana palustris*
Northern Leopard Frog	*Rana pipiens*
Southern Leopard Frog	*Rana spenocephala*
Wood Frog	*Rana sylvatica*
Carpenter Frog	*Rana virgatipes*

Source: New Jersey Department of Environmental Protection 2000 as cited in U.S. Navy 2001